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ON

DISEASES OF THE SKIN.

J. S. Ferris.

BY

ERASMUS WILSON, F.R.S.,

CONSULTING SURGEON TO THE ST. PANCRAS INFIRMARY.

Third American,

FROM THE THIRD LONDON EDITION.

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1852.

"Une méthode, un ordre, une classification systématique est indispensable à la connaissance approfondie de la Pathologie Cutanée."

GIBERT.

"At prudenter a prudente medico: abstine si methodum nescis."

BOERHAAVE.

1 11
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1852

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SIR JAMES CLARK, BART., M.D., F.R.S.

Physician in Ordinary to the Queen, and to the Prince Albert,

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In reprinting this volume from Mr. Wilson's third and improved edition, a few references to late authorities have been added, which will be found enclosed in brackets, [—].

The Plates alluded to throughout the work may be had separately.

Philadelphia, April, 1852.

A. S. Ferris.

PREFACE.

The study of diseases of the skin offers a natural division into two parts—a scientific and practical part. The former embraces all that belongs to structure, physiology, and pathology; the latter, the application of the results of these investigations to the treatment and cure of disease. Conceiving that no real improvement could be made in the practical department of the subject in any other way than through the advancement of the scientific portion, I have continued to bestow much attention and labour on the microscopic examination of the cutaneous tissues. In the following pages, I have embodied a paper[1] on the "Development and Growth of the Epiderma," in which I have put forth some original and curious observations on the structure and formation of the epidermal cell. I found the perfect cell to be composed of secondary and tertiary cells, and the essential and primary constituent of these cells to be granules of extreme minuteness. As a contribution to structural anatomy, these observations are important, inasmuch as they demonstrate the theory of the development of a cell advanced by Schwann to be inapplicable to the cells of the epiderma and epithelium. I next found that these minute granules were the agents of coloration of the skin, that they were in reality the pigment: the difference in their tint giving rise to all the known diversities of shade met with in the rete mucosum, the nails, and the hairs. Further examination proved that the pigment of the choroid membrane of the eyeball and that of melanosis were composed of identical organisms. With a view to apply these observations of normal structure to the morbid anatomy of the skin, I made a careful examination of the epidermal cells of the scales of lepra, and found the primitive granules of the latter to be abnormally formed; they were evidently in a state of hypertrophy from imperfect nutrition. I have not had an opportunity of proceeding further with this inquiry, but I intend to pursue it whenever I shall have leisure to devote to its prosecution.

The structure of the hair has also obtained a considerable share of my attention, and the results of my research are reported in the following pages. It is interesting to find the minute structure of the hair to harmonize completely with its analogue, the epiderma; being composed of the same primitive granules, and differing only in their arrangement, as being subservient to a different end. In the hair, these granules are disposed in such regular order as to have the appearance of parallel fibres, and their diversity of tint gives rise to the colour of the hair. Under the influence of disease, the hair is liable to a change, which may be compared to the alteration of the epiderma which takes place in Lepra—that is, it becomes lax in texture, brittle, twisted, and loses its natural colour. The disease of which this morbid change is a symptom is the common "ringworm." Now, the examination of the hair in ringworm exhibits its primitive granules morbidly enlarged like those of the epidermal cells of Lepra; both diseases are, in fact, a granular degeneration of the cells of which the epidermal product is composed. These may be regarded as first results of the application of scientific research to practical use; they are humble examples, but they, nevertheless, offer a strong encouragement to persevere.

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[1] Read before the Royal Society, June 19, 1845.

The plates illustrating this work are fifteen in number, eight being coloured after nature, the remainder being plain. The coloured plates each represent a group of diseases. For example, if the reader wish to place before his eyes the group of "congestive diseases" of the derma, he may turn to Plate 7, where he will find displayed, Urticaria, Roseola, and Erythema; Erysipelas being omitted, partly because its illustration is less necessary than that of other cutaneous diseases, and partly on account of the large extent of surface its delineation would require. If the reader would contrast the "congestive group" of cutaneous diseases with others, he will find in Plate 8, the "asthenic effusive group," namely, Pemphigus and Rupia; in Plate 9, the "sthenic effusive group," namely, Herpes and Eczema; in Plate 10, the "pustular group," Impetigo and Ecthyma; in Plate 11, the "papular group," Lichen, Strophulus, and Prurigo; in Plate 12, the "squamous group," Lepra, Psoriasis, and Pityriasis; Plate 13 illustrates the peculiar morbid alteration of the skin termed Lupus non exedens; and Plate 14, certain diseases of the hair-follicles and hairs, namely, Acne, Sycosis, Favus, and Trichonosis furfuracea.

Another feature in the Plates which accompany this volume, and one at which I have especially aimed, is that of bringing together as many of the varieties of a given disease as possible. My reasons are twofold—firstly, that the leading characters of these varieties may be the more easily comprehended and contrasted; and, secondly, that the reader may be placed in possession of the largest amount of illustration admitting of being compressed into a limited space. For example, in the upper division of Plate 7 will be found four varieties of Urticaria, four varieties of Roseola, and, in the lower, six varieties of Erythema; making in a single plate fourteen specimens of cutaneous disease, the separate figures not being in any way stinted in dimensions, but being, in reality, of the size of life. With the most ample space at my command, I could have done little more than this. I might have repeated forms, but the matter to be impressed on the mind could not have been rendered more clear or nore precise. Plate 8 represents, in the upper division, two varieties of Pemphigus; and, in the lower, three varieties of Rupia. The upper division of Plate 9 exhibits four varieties of Herpes, and the lower, the same number of varieties of Eczema. In Plate 10, the number of varieties of Impetigo, in the upper division, is four; and in the lower division, the varieties of Erythema are three. In Plate 11, there are, in the upper division, six varieties of Lichen; and in the lower, four varieties of Strophulus, and one of Prurigo. Plate 12 contains, in the upper division, three varieties of Lepra; and in the lower, three varieties of Psoriasis, and one of Pityriasis. Plate 13 is devoted to the single subject of Lupus non exedens, while in Plate 14 are four varieties of Acnė, one of Sycosis, two of Favus, and one of Trichonosis. So that, in the limited compass of eight octavo plates, no less than sixty-one subjects are represented.

The arrangement of cutaneous diseases followed in this work is one which takes Anatomy and Physiology for its groundwork, and therefore becomes entitled to the designation of NATURAL SYSTEM OF CLASSIFICATION.

The derma and its dependencies, its glands, and its follicles, are the undoubted seat of all the changes which characterize Cutaneous Pathology. These, then, constitute four *Primary Divisions* of the subject—namely:

I. DISEASES OF THE DERMA,
II. DISEASES OF THE SUDORIPAROUS GLANDS,
III. DISEASES OF THE SEBIPAROUS GLANDS,
IV. DISEASES OF THE HAIRS AND HAIR-FOLLICLES.

I. The *Derma*, complex in its organization, and multiple in its functions, naturally presents us with a much larger field of investigation than the rest. It may be subject to changes which constitute the five *Secondary Divisions* of this Classification—namely:

1. Inflammation of the Derma.
2. Hypertrophy of the Papillæ of the Derma.
3. Disorders of the Vascular tissue of the Derma.
4. Disorders of the Sensibility of the Derma.
5. Disorders of the Chromatogenous Function of the Derma.

1. *Inflammation of the Derma,*—of an organ of so much complexity and importance, naturally gives rise to a variety of effects. These effects served by their diversity as the foundation of the Orders of Willan, and in the *Natural Classification* they compose a series of Groups in the Secondary Division under consideration. The Groups of Cutaneous disorders, illustrative of changes depending on Inflammation of the tissues of the Derma, are six in number—namely:

a. Congestive Inflammation of the Derma,
b. Effusive Inflammation of the Derma,
c. Suppurative Inflammation of the Derma,
d. Depositive Inflammation of the Derma,
e. Squamous Inflammation of the Derma,
f. Inflammation of the Derma from the presence of Acari.

The first of these groups I have deemed it advisable to divide into two sub-groups—namely, into such as are characterized by *inflammation of the derma and mucous membranes, with constitutional symptoms of a specific kind;* and such as consist simply of *inflammation of the derma without constitutional symptoms of a specific kind*, the mucous membranes being less conspicuously disordered. It may be said that the diseases comprised in the first sub-group,—viz., Rubeola, Scarlatina, Variola, &c.,—though heretofore considered and treated of as diseases of the skin, are, in reality, diseases of the system, of which the alteration in the skin is a symptom of comparatively secondary importance. I cheerfully assent to the validity of this argument, but I am, nevertheless, unwilling to lose a group of diseases so rich and important in their illustration of the pathological changes wrought in and upon the skin by active inflammation.

I have styled *depositive* inflammation of the derma, that alteration which gives rise to the production of small elevations of the skin, termed pimples and tubercles. The order Tubercula of Willan would have formed a sub-group under this head, had I found diseases admitting of such an arrangement. But, upon examination, after distributing some of his genera in more appropriate places, and rejecting others, either on the ground of not being diseases primarily originating in the skin, or of not being diseases of this climate, Lupus and Kelis alone remained.

The last group—namely, "Inflammation of the Derma from the presence of Acari," may appear to the eyes of some of my readers in the light of an innovation; but there is no part of the Pathology of Cutaneous Disease, of the truth of which I feel better satisfied than of this. I have long observed the disease with interest and attention; I have had ample opportunity, from my boyhood upwards, of tracing its progress upon the skin, and the experiments of M. Gras, recorded in the latter chapter of this volume, I have seen exemplified in numberless instances. I might appeal to those very experiments as a sufficient proof of the accuracy of my view of the nature of scabies, were it not that their author falters in his conclusions. Blinded by the mists of prejudice that surrounded him on every side, he stands amazed before the vision of a stimulus of the nerves of the skin, prolonging its effects after the cause is withdrawn. Surely pathology can furnish us with a thousand such instances. But in his doubt he sinks still more deeply into the slough that a mere physiological question had thrown in his path; for he becomes lost to the fact, that if a living animalcule act simply as a cause of irritation, and give rise to certain effects, an inorganic substance may also, by exciting irritation, give rise to like effects. I have seen instances in illustration of this, in which the eruption of scabies has been prolonged for months, by a continuance in the use of the means which destroyed the original cause—namely, sulphur ointment. But are we, therefore, to conclude that this sulphur irritation, so kept up for an indefinite period after the cure of the real disorder, is an "affection psorique?" Is it not rather an *affection sulphurique?* Into this error, strange to say, M. Gras falls in the very last page of an otherwise excellent pamphlet. There is, he says, "An important circumstance, to which I ought to draw attention; I mean the persistence of vesicles after the close of an active treatment, when dead acari only are to be found, and when, by dint of friction and baths, all the ova must have been destroyed; it is rare, indeed, that we discover living sarcoptes after three or four days of treatment; nevertheless, the *disease* often continues for ten or fifteen days. This fact is, in truth, so constant, that, on perceiving an abundant eruption of vesicles (psorique) covering the hands, when no cuniculus is apparent, we may instantly conclude that the patient has been submitted to treatment." "In one case, I saw a young man in whom itch had re-appeared eight days after his dismissal from the hospital, without his having been exposed to the contagion afresh; his hands were covered with well-formed acuminated vesicles, but I was unable to discover the slightest trace of cuniculus. In considering this fact by the side of analogous cases, in which scabies has proved rebellious to every kind of treatment, and where the vesicles may disappear during an acute disease, to re-appear subsequently, we should be tempted to believe that the action of the acarus in the production of scabies was not merely local and mechanical, but that it was capable of acting on the economy in a manner that we might call *vital* and *physiological*. The acarus would, consequently, be nothing more than the exciting cause of the disease, without *constituting it entirely*. In this manner we might, up to a certain point, explain why certain kinds of transient itch may be transmitted from animals to man, although the sarcoptes of the animal may be wholly unable to live and propagate on the skin of man. In adopting this view, the treatment offers two indications—1. To destroy the acarus; 2. To treat the '*affection psorique*,' which, nevertheless, would get well of itself when once the sarcoptes had been entirely removed."

It is to be regretted that M. Gras should have failed so signally in his reasoning, when the prize for excellent observations was already in his hands. I am thoroughly convinced, and so long as I possess that conviction, shall ever continue to maintain that the Acarus is the sole and only cause of scabies, and that every eruption, however acuminated and well-defined its vesicles, if it be deficient in the living cause, is not scabies. Many dermatologists, it is true, acknowledge the existence of the acarus scabiei in itch, but they regard it as a complication, and not as the real cause of the disease. They still treat of scabies as a vesicular eruption, and accuse the blood and system of taking a share in the affection. I may render this affirmation more apparent, by quoting the opinions of some of the most eminent of modern dermatologists.

Rayer, treating of the causes of scabies, remarks—"The most momentary contact of the *fluid* secreted by its vesicles is enough to communicate the infection," (p. 331.) Now this is not the fact, unless the fluid of the vesicles contain the animalcule or its ova, which is not usually the case, and even in that event, the contact must be such as to enable the former to take a firm hold upon, and bury himself in the epiderma, or to afford time to the latter to hatch and give exit to the LIVING CAUSE of scabies. The same author observes—"It is, further, rare to discover these insects on the abdomen and on the groins, where the eruption is nevertheless very common and very apparent; moreover, scabies is known to continue when no more acari are to be discovered." It would occupy too much space to explain, singulatim, the objections made by the opponents of the views on this subject which I advocate in this volume; it is sufficient to mention, as a commentary on the last passage, that Rayer speaks of the acarus upon the report of others; he has never extracted the animalcule himself; moreover, in reference to the former part of the preceding sentence, it must be recollected, that a single acarus is always the cause of a number of vesicles, that number increasing with the susceptibility of the portion of skin invaded; and in reply to the latter part,—the assertion is unsupported by fact.

Cazenave and Schedel,[1] referring to the proximate cause of scabies, observe—"The proximate cause is wholly unknown—an acid principle, a peculiar ferment, and lastly, the presence of an insect, have each in its turn been advanced. This latter hypothesis is admitted by a considerable number of physicians; nevertheless, if we cannot affirm that the creature has no existence, we are at least very far from believing that it does."

Gibert speaks cautiously relatively to the cause of scabies, although he confesses to have seen the acarus several times. It is impossible, however, from his writings, not to perceive that he exercises considerable mental reservation on the side of a different origin and cause than the animalcule in question. Thus, speaking of the frequency of the sanguine and lymphatic temperaments in France, he observes—"It would be unfair to attribute the more frequent occurrence of scabies in persons of this temperament solely to a natural predisposition to the attack of contagious diseases, and to the more active absorption really existing in these individuals."[2] And again he remarks—"The seasons during which the skin is most permeable are those which favour the contagion." In a lecture reported in the Gazette des Hôpitaux for July 31, 1841, the same author inquires—"Is the acarus scabiei the cause or the product of the eruption?"

Devergie, in the Gazette des Hôpitaux for July, 1842, observes—"Since the publication of the clear and precise description of the acarus scabiei by Raspail, no one can doubt the existence of the animalcule. The questions to be decided are—is the disease engendered by the transportation of the insect from one person to another? Is it the *fluid of the vesicles* which excites the eruption? Is it by the ova only that the disease is propagated? Or, does the vesicle give origin to the animalcule?"

The history of the itch-animalcule, which forms a curious narrative, I have given in the last chapter of this work. I have many times extracted the little creature from its epidermal haunts in cases of scabies, and I have preserved numerous specimens of it, which are open to the examination of those members of the profession who may feel an interest in viewing the *atom* that has caused so much inkshed

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[1] Abrégé Pratique des Maladies de la Peau, p. 16.

[2] Traité Pratique des Maladies de la Peau. Second Edition, p. 125.

A. S. Ferris.

throughout the civilized world, and, like another Helen, has aroused battles and contention, that have been deemed worthy of being handed down to future ages, in a volume dedicated especially to their narration, the "Acaromachia."[1]

2. *Hypertrophy of the Papillæ of the Derma* forms a well defined group, being necessarily attended with increased formation of epiderma. It embraces in its consideration four characteristic examples—namely, Verruca, Tylosis, Clavus, and Pachulosis.

3. *Disorders of the Vascular tissue of the Derma.* The alterations of the vascular tissue are limited to two—hypertrophy of that structure, as in the instance of Vascular Nævus; and altered relation between the containing and the contained parts, inducing Purpura.

4. *Disordered Sensibility of the Derma*, referrible to the nervous system, constitutes the distressing affections denominated Hyperæsthesia, and Pruritus.

5. *Disorders of the Chromatogenous Function of the Derma* compose a group corresponding in general expression with the order Maculæ of Willan. It admits of division into three sub-groups—namely, into those diseases which are characterized by Augmentation of pigment, into those which present a Diminution of pigment, and into those which coincide in a morbid Alteration of the pigment; each of these sub-groups having its separate examples.

II. The SUDORIPAROUS GLANDS, with their beautifully spiral excretory ducts, are a system of organs of modern discovery, for a knowledge of which science is indebted to the researches of Purkinje, Breschet, and Roussel de Vauzeme, into the minute anatomy of the skin. The first figures of these structures, drawn from nature, which appeared in this country, were published some years since in the large work of anatomical plates, edited conjointly by Dr. Jones Quain and myself. The Pathology of the sudoriparous glands has not yet been separately investigated, but sufficient observations have been made relatively to the perspiratory secretion, to admit of an arrangement of their diseases into such as give rise to

Augmentation of secretion.
Diminution of secretion.
Alteration of secretion.

III. The SEBIPAROUS GLANDS, in reference to their diseases, constitute a somewhat numerous, but highly interesting division, under five distinct heads—namely,

Augmentation of secretion.
Diminution of secretion.
Alteration of secretion.
Retention of secretion.
Inflammation of the glands and adjacent tissues.

This division has been enriched by a very curious and remarkable discovery made by Dr. Gustav Simon, of Berlin. Dr. Simon ascertained the existence of certain articulated animalcules of goodly size, in the sebaceous substance which collects and concretes in the hair-follicles, and which, in an advanced degree, constitutes those little accumulations termed comedones, or grubs; he also finds them in those still further advanced stages of the same alteration, termed acne punctata. Directed to the haunts of this singular animal by the anatomist above named, I have examined several hundred specimens, and have been led to results different from those recorded by Dr. Simon relative to the alterations which the creature undergoes during development. With the aid of Mr. Bagg, an artist so justly eminent for anatomical delineation and engraving, I have been enabled to present my readers with a faithful and accurate portrait of this little animal, in which not only the form but much of the texture of the creature is exhibited. With the advice of the entomologists of Berlin, Dr. Simon named the animal acarus folliculorum, under the assumed belief that the specimens which he had examined were the larval condition of an unknown acarus. My researches have convinced me that this is not the case, that the animalcule is perfect in the state in which it has been observed, and, therefore, being in structure and organization so different from an acarus, it would be injudicious to retain that name. Under these circumstances, I thought it desirable to name the little creature STEATOZOON FOLLICULORUM, a name which conveys a more correct signification.

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[1] A work recently published in France.

To this division, also, I have transferred the molluscum contagiosum of Bateman and his disciples. This disease, which is a small tumour of the skin produced by the enlargement, from impaction with altered sebaceous substance, of a sebiparous gland, has been recently illustrated by two excellent papers which appeared in the 57th volume of the Edinburgh Medical and Surgical Journal, from the pens of Dr. Henderson and Dr. Paterson. Both of these writers endeavour to perpetuate the opinion, so long entertained, of the contagious nature of this disease. Dr. Henderson and Dr. Paterson inoculated the fluid expressed from the tumours, unsuccessfully; had these gentlemen made the experiment by friction of the morbid fluid into a part of the body richly supplied with sebiparous glands, they would have been equally unsuccessful, for *molluscum is not contagious.* Dr. Paterson regards the contents of the tumours as the real disease, and he ingeniously attributes to the development of cells from nuclear matrices, as in the instance of cancer, the production of the disorder. By means of the same hypothesis, he explains the transmission of the disease by contagion; for one of these cytoblasts reaching a favourable nidus for its development—e. g., the excretory duct of a sebiparous gland—speedily gives birth, by excentric genesis, to myriads of young cells, and a collection is produced, which constitutes the molluscous tumour. But before this hypothesis can be admitted, that must be proved which is equally hypothetical—namely, the contagion of molluscum.

Sycosis, one of the diseases included in the last group of this division, has been recently made the subject of research by M. Gruby, of Vienna. This gentleman has announced the discovery of a cryptogamic plant developed in the root of the hair and in the follicle around the hair, in a form of sycosis, to which he assigns the designation, *Mentagra contagiosum.* I have not succeeded in finding this vegetable organism, and have strong doubts of its existence. M. Gruby suggests as an appropriate name for the contagious variety of sycosis, the term *Mentagrophyte.*

IV. DISEASES OF THE HAIRS AND HAIR-FOLLICLES offer to our examination a variety of abnormal and morbid changes which are liable to occur in relation with these important organs. These changes admit of consideration under the six following heads—namely,

Augmented formation.
Diminished formation.
Abnormal direction of the hair.
Alteration of colour.
Diseases of the hairs.
Diseases of the hair-follicles.

Among the diseases of the hair-follicles I have placed Favus, an affection which has been illustrated of late by the interesting discovery by Remak, Schonlein, and Gruby, of an organic formation within its crusts, very closely resembling a vegetable growth. The last of these authors, however, entertains an opinion relative to the nature of favus different from that which I feel bound to advocate. He considers the crust as an independent vegetable formation enrooted in the follicle of the hair, and drawing from the contiguous tissues its means of nourishment. I am far from agreeing with him in this respect, but continue to believe, as I have hitherto believed, previously to the discovery in question, that the morbid condition of the follicle gives rise to the production of the abnormal organic substance constituting the crust. Its vegetable nature is hypothetical. In harmony with the view entertained by M. Gruby, this gentleman suggests that favus should form a new order, with two other diseases of vegetable origin, aphtha and sycosis contagiosum, under the designation *Nosophyta;* that favus should be styled *Porrigophyte;* and aphtha *Aphthophyte.* It will be time to make these alterations when the observations on which they are proposed to be based shall be proved to be incontestable.

Dr. John Hughes Bennett has made the "parasitic fungi found growing in living animals" the subject of a paper read before the Royal Society of Edinburgh in the month of January, 1842. This gentleman gives an account of the mucedo of favus, and has illustrated his observations by some excellent delineations. He remarks upon the association of parasitic vegetation with the matter of tubercle, and observes that the peculiar constitution or cachexia favourable and predisposing to their growth is the tubercular or scrofulous.

"In man all the vegetations yet discovered have been found connected with the matter effused into the textures in scrofulous constitutions. The fungi found by myself, for instance, growing in the tuberculous cavities of the lungs, and those discovered by Schonlein, and described by Gruby, constituting scrofulous eruptions on the skin, grew on a finely granular amorphous mass, which presented no evidence of organization. Chemical researches have shown that this form of tubercular matter is principally composed of albumen, which explains the large proportion of this animal principle present in the crust of the Porrigo or Tinea favosa, according to the analysis given by Alibert." The succeeding observations of Dr. Bennett harmonize exactly with the conditions under which we commonly find favus first showing itself in man—namely, in cachectic subjects, in poor-houses, public-schools, &c. "The fungi found by MM. Rousseau and Serrurier in the parroquet, grew on a species of false membrane. What the nature of this membrane was, is not stated, but it is distinctly mentioned that the animal died of laryngeal and pulmonary phthisis. In pigeons, also, the same authors describe it as commonly induced by exposure to cold and moisture, circumstances well known to be the most common cause of scrofula, and of tubercular depositions. According to the observations of Valentin, the parasitic confervæ found growing on fish are connected with a diseased state of the animal, and are induced by keeping them in narrow vessels and foul water. The gold fish was evidently unhealthy which furnished the vegetations which I have myself described, and I have shown that these were connected with a granular, inorganic, albuminous matter, identical with that found in the lungs of phthisical individuals, and in the crusts of Porrigo favosa." Dr. Bennett, in the course of his investigations, made the singular discovery of an eruption of favus upon the face of the common mouse, and he connects this observation with the odour of mice, so remarkable in this disease in man. In the mouse "the crusts were of a more irregular form, prominent in the centre, not forming distinct capsules, or perforated by a hair. They formed a prominent whitish friable mass on the left side of the face of the animal, about the size of a small bean. Examined microscopically, they presented the cylindrical tubes and sporules *en masse*, in every respect identical to those which grow on the scalp of man."

Such is a brief sketch of the scheme, which I propose to designate a NATURAL SYSTEM OF CLASSIFICATION OF DISEASES OF THE SKIN, and I trust that its clearness and simplicity will be the means of rendering a branch of medical science, which has hitherto with much reason been regarded as obscure and confused, more intelligible and precise. For the convenience of my readers I have arranged the classification in a tabular form.

I. DISEASES OF THE DERMA.

Inflammation	Congestive	Specific	Rubeola. Scarlatina. Variola. Varicella. Vaccinia.
		Non-Specific	Erysipelas. Urticaria. Roseola. Erythema.
	Effusive	Asthenic	Pemphigus. Rupia.
		Sthenic	Herpes. Eczema. Sudamina.
	Suppurative		Impetigo. Ecthyma.
	Depositive		Strophulus. Lichen. Prurigo.
	Squamous		Lepra. Psoriasis. Pityriasis.
	From Parasitic Animalcules		Scabies.
	Tubercular		Lupus. Kelis.
Hypertrophy of the Papillæ			Verruca. Tylosis. Clavus. Pachulosis.
Disorders of the vascular tissue			Vascular Nævi. Purpura.
Disordered sensibility			Hyperæsthesia. Pruritus.
Disordered Chromatogenous Function	Augmentation of Pigment		Melanopathia. Pigmentary Nævi.
	Diminution of Pigment		Albinismus. Leucopathia.
	Alteration of Pigment		Ephelis. Lentigo. Chloasma. Melasma.
	Chemical Coloration		Oxide of Silver Stain.

II. DISEASES OF THE SUDORIPAROUS GLANDS.

Augmentation of Secretion	Idrosis.
Diminution of Secretion	Anidrosis.
Alteration of Secretion	Osmidrosis. Chromidrosis. Hæmidrosis.

III. DISEASES OF THE SEBIPAROUS GLANDS.

Augmentation of Secretion		Stearrhœa simplex.
Diminution of Secretion		Xeroderma.
Alteration of Secretion		Stearrhœa flavescens. Stearrhœa nigricans. Ichthyosis.
Retention of Secretion	Duct open	Comedones. Molluscum simplex. Sebaceous accumulations. Cornua.
	Duct closed	Sebaceous Miliary Tubercles. Calcareous Miliary Tubercles. Serous Cysts. Encysted Tumours.
Inflammation of Glands and adjacent Textures		Acne. Sycosis.

IV. DISEASES OF THE HAIRS AND HAIR-FOLLICLES.

Augmented formation	Pilous nævi.
Diminished formation	Alopecia. Calvities.
Abnormal Direction	Trichiasis. Felting.
Alteration of Colour	Canities.
Diseases of the Hairs	Trichonosis Furfuracea. Trichonosis Plica.
Diseases of the Hair-follicles	Inflammatio Folliculorum. Favus.

Classification would appear to have been almost coeval with the earliest observation of Diseases of the Skin. Hippocrates, the Father of Physic, established a truly philosophical system, namely, an Etiological Classification of these diseases, dividing them into local and constitutional. The former he regarded as of independent existence, and the latter as the consequence of a morbid state of constitution, in which an attempt is made, on the part of Nature, to throw out the disease. This doctrine was subsequently adopted by Lorry, and more thoroughly explained; and its truth has been admitted by all our most recent and best writers. The Etiological System has been recently revived in France by M. Baumés, in a work entitled "Nouvelle Dermatologie."

It failed not to engage the attention of the Ancients, that cutaneous diseases manifest a remarkable disposition to affect certain localities of the skin; that some are confined to the head alone, while others are distributed over the rest of the body. In the fertile mind of Galen, this observation became the ground-work of a TOPOGRAPHICAL SYSTEM of classification, according to which, the diseases of the skin are divided into two classes; those that have their seat upon the head, and those that affect the surface of the body generally. The topographical classification was advocated very strongly by Jerome Mercurialis, a celebrated physician of Italy, in the sixteenth century. Mercurialis, moreover, subdivided the diseases affecting the body into two secondary groups—viz., such as produce alteration of colour, and such as produce alteration of smoothness. This classification pays no regard either to the structures involved by disease, or to pathological principles; hence it is open to many and serious objections, since, according to it, the same morbid condition, differing simply in situation, would be regarded as two different diseases. The Topographical System, somewhat modified, was followed by our countryman Turner, in 1714, and was thought not unworthy of revival by Alibert in his first classification.

In the early part of the seventeenth century, it occurred to Riolanus to arrange the diseases of the skin according to their *appearances*, and without reference to their situation. He accordingly divided them into three groups—*Pustules*, *Deformities*, and *Tubercles*. This rude scheme, at a later period, became developed into the ARTIFICIAL CLASSIFICATION of the present day. Plenck, who published his views in 1776, divides cutaneous diseases into fourteen classes; but for the purpose of establishing so many subdivisions, he falls into the serious error of considering the different stages of the same affection as separate diseases. The system of Plenck, considerably modified and improved, became the groundwork of the classification of Willan.

The fourteen classes established by Plenck are the following:—

Maculæ,
Pustulæ,
Vesiculæ,
Bullæ,
Papulæ,
Crustæ,
Squamæ,
Callositates,
Excrescentiæ,
Ulcera,
Vulnera,
Insecta,
Morbid unguium,
Morbi pilorum.

The classification of Willan, published in 1798, consisted of eight orders—viz.,

Papulæ,
Squamæ,
Exanthemata,
Bullæ,
Vesiculæ,
Pustulæ,
Tubercula,
Maculæ.

Willis, in the latter part of the seventeenth century, arranged Cutaneous Diseases, in accordance with their LOCAL CONDITION, into two groups—namely, into those attended with swelling, and into those in which no tumefaction was present.

The only modern classification which has been attempted since the time of Willan, is that of the distinguished dermatologist, Alibert, who claimed for his perfected classification the title of *Natural System*. Alibert assembled the whole of the diseases of the skin into one large group, under the name of *Dermatoses*, and this group he considered to be composed of twelve smaller groups—namely,

Dermatoses Eczemateuses,
" Exanthemateuses,
" Teigneuses,
" Dartreuses,
" Cancereuses,
" Lepreuses,
" Veroleuses,
" Strumeuses,
" Scabieuses,
" Hemateuses,
" Dyschromateuses,
" Heteromorphes.

These were the twelve branches of the celebrated "Arbre des Dermatoses" of Alibert, a system grand in conception, but inapplicable to the purposes for which it was intended, a system which lives at the present only in the memory of the past, which has ceased to exist even beneath the foliage of the "*tilleuls*" that smiled upon its birth.

The Genera included under each of these groups are—

Dermatoses Eczemateuses.—Erythema; erysipelas; pemphix; zoster; phlyzacia; cnidosis;[1] epinyctide;[2] olophlyctide;[3] ophlyctide;[4] pyrophlyctide;[5] anthrax; furunculus.

Dermateuses Exanthemateuses.—Variola; vaccinia; clavelée;[6] varicella; nirle;[7] roseola; rubeola; scarlatina; miliaria.

Dermatoses Teigneuses.—Achor;[8] porrigo; favus; trichoma.[9]

Dermateuses Dartreuses.—Herpes;[10] varus;[11] melitagra;[12] esthioméne.[13]

Dermateuses Cancereuses.—Carcinoma; keloide.

Dermatoses Lepreuses.—Leuce;[14] spiloplaxie;[15] elephantiasis; radesige.[16]

Dermatoses Veroleuses.—Syphilis; mycosis.[17]

Dermatoses Strumeuses.—Scrofula; farcinoma.

Dermatoses Scabieuses.—Scabies; prurigo.

Dermateuses Hemateuses.—Peliosis;[18] petechiæ.

Dermatoses Dyschromateuses.—Pannus;[19] achrome.[20]

Dermatoses Heteromorphes.—Ichthyosis; tylosis; verruca; onygos;[21] dermatolysie;[22] nævus.

The artificial classification of Willan is open to the serious objection of assembling together, in the same class, disorders of the most opposite kind, and of separating different phases of the same disease. Thus, the association of purpura with rubeola and scarlatina; erysipelas with pemphigus; ichthyosis with lepra; scabies with variola and porrigo; eczema with varicella and vaccinia; acne with verruca; and nævus with ephelis, is opposed to every principle of affinity of disease. While the separation of variola from varicella and vaccinia; and rubeola and scarlatina from variola, is equally objectionable.

Another objection to the Willanean Classification is less important, but still a blemish in his system. I allude to the imitation of the divisions and subdivisions employed in the arrangement of zoological or botanical subjects. Thus, starting with a *Class*, Cutaneous Disorders, Willan established eight *Orders;* each of these orders has its *Genera*, and the Genera their *Species*. But pathological appearances do not admit of such a gradation of subdivision, and no advantage can possibly flow from its adoption. The most that can be admitted is a class of Cutaneous Diseases, these divisible into orders or groups; but the groups separate at once, to the exclusion of genera, into individual diseases, or species, and varieties of those diseases. The differences between any two varieties are never so strongly marked as to admit

[1] Urticaria.

[2] A nocturnal eruption, disappearing by day, described only by Alibert.

[3] Herpes.

[4] Aphthæ.

[5] Malignant pustule.

[6] A varioloid of sheep transmissible to man.

[7] A varioloid.

[8] Crusta lactea.

[9] Plica polonica.

[10] The squamous diseases, Lepra, Psoriasis, and Pityriasis.

[11] Acne and Sycosis.

[12] Impetigo.

[13] Lupus.

[14] The Jewish leprosy.

[15] Malum mortuum.

[16] The name given to an elephantiasis of northern countries, in Norway.

[17] This genus includes Frambœsia and Molluscum.

[18] Purpura.

[19] This genus includes Lentigo, Ephelis, Pityriasis versicolor and Pityriasis nigra.

[20] Vitiligo; Albinismus.

[21] Onychia.

[22] Abnormal extensibility of the skin.

of their consideration as species, in the proper sense of employing that term.

In the NATURAL SYSTEM of Classification, I have endeavoured to avoid the objections which may be urged against the artificial arrangement. I have prevented the jostling of incompatibles, and, as far as I am able, combined affinities, and this without disturbing a familiar nomenclature. Indeed, I have scarcely changed a single term of Willan's glossary, and in the very few instances in which I have departed from this rule, I have been guided by weightier considerations than those of accommodating diseases to a system of my own.

In conclusion, I may remark, that my aim has been to simplify the diagnosis and treatment of disease in a branch of medicine to which I have given some years of thought, and to the mature study of which I shall continue to devote all the leisure which the pressing engagements of medical practice will allow.

17 Henrietta Street, Cavendish Square,
May, 1851.

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DISEASES OF THE SKIN.

CHAPTER I.

ANATOMY AND PHYSIOLOGY OF THE SKIN.

1. The skin is the exterior investment of the body, which it serves to cover and protect. It is continuous at the apertures of the internal cavities with the lining membrane of those cavities,—the internal skin, or mucous membrane; and is composed essentially of two layers, the derma and epiderma.

2. The derma, or cutis, (Plate 2,) is chiefly composed of areolo-fibrous tissue, besides which it has entering into its structure, elastic and contractile fibrous tissue, together with blood-vessels, lymphatic vessels, and nerves. The areolo-fibrous tissue exists, in its most characteristic form, in the deeper strata of the derma, which are consequently dense, white and coarse, while the superficial stratum is fine in texture, reddish in colour, soft, raised into minute papillæ, and endowed with an abundant supply of vessels and nerves. This peculiarity of structure of the derma has given rise to its consideration as consisting of two layers—the superficial or papillary layer, and the deep stratum or corium.

3. The epiderma, or cuticle, (Plate 1,) is a product of the derma, which it serves to envelop and defend. That surface of the epiderma which is exposed to the influence of the atmosphere and exterior sources of injury, is hard and horny in texture, while that which lies in contact with the sensitive papillary layer of the derma, is soft and composed of cells. Hence this membrane, like the derma, offers two strata for our observation, the outermost stratum, commonly spoken of as the epiderma, and the innermost stratum, or rete mucosum. The latter was considered and described by Malpighi as a distinct membrane, and is frequently referred to under the name of rete Malpighianum.

4. Besides the derma and epiderma, the skin includes certain important secreting organs, and certain appendages of the epiderma, which call for separate notice. The secreting organs are the sudoriparous and sebiparous glands; and the appendages of the epiderma, the hairs and the nails.

5. The derma presents considerable variety in degree of thickness in different parts of the body. Upon the more exposed regions, as

the back, the outer sides of the limbs, and the palms[1] and soles, it is remarkable for its thickness; while on protected parts, as the inner sides of the limbs, and the ventral surface of the trunk, it is comparatively thin. On the eyelids, the penis, and the scrotum, again, it is peculiarly delicate. The papillary layer also presents differences in extent of development; on the palms of the hands, the pulps of the fingers, and the soles of the feet, this layer is thick, and the papillæ numerous and of great length, while in most other situations it is thin, and the papillæ are little apparent. Some contrariety is observed, besides, in the relative proportion of the layers of the derma; for on the back, where the corium is exceedingly thick, the papillary layer is but slightly developed, while on the pulps of the fingers, where the latter is strikingly manifest, the corium is thin.

6. The areolo-fibrous tissue of the derma is constructed of fibres of two kinds—namely, of minute cylindrical fibres, which are identical in their nature with the delicate wavy fibres of common areolar or cellular substance, and of fibres of elastic tissue, presenting their characteristically curved ends, and branching and anastomosing distribution. In the superficial strata of the corium, the white fibres are collected into small fasciculi, and form an intricate interlacement, which supports the papillæ, and constitutes a nidus for the capillary rete of vessels and nerves. In the middle strata, the fasciculi are larger and flattened, and the areolar network coarse; while in the deep layer, (Plate 2, fig. 3,) the fasciculi are still broader—namely, about a line in diameter, and the areolar spaces two lines. These latter are occupied by small masses of adipose tissue, while the fasciculi are continuous with the subcutaneous areolar membrane. The yellow elastic fibres are solitary in their arrangement, they are abundant in the superficial layers of the corium, but rare and scarcely met with in the deeper strata. The areolæ left by the interlacement of the fasciculi of the areolo-fibrous tissue, are the channels by which the branches of vessels and nerves find a safe passage to the papillary layer, in which, and in the superficial strata of the corium, they are principally distributed.

7. The contractile fibrous tissue of the derma has been demonstrated hitherto only in certain parts of the human skin, as in the nipples and scrotum, but it undoubtedly exists in the corium of every part of the body. It consists of fibres of a reddish hue, somewhat larger than those of areolar tissue, and semi-transparent. These fibres are collected into fasciculi, sometimes lying parallel with each other, and forming membranous layers, at other times interlacing in every direction, and constituting a firm web. They are met with in every part of the corium, but are most abundant in the coarse network of its under surface. This tissue is easily perceived in the corium of some animals, where it forms a web around the sebiparous glands and hair follicles. It probably has the same arrangement in the skin of man; in the former situation acting as a compressor of the sebiparous gland, and an important auxiliary to the current of its

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[1] In the palm of the hand I found the derma to measure three-fourths of a line in thickness.

secretion; in the latter producing an erection of the hairs analogous to the bristling which takes place in animals. That appearance of the skin produced by cold or fear, (spasmus periphericus,) that we term *cutis anserina*, or goose-skin, is due to the presence of this contractile fibrous tissue.

Mr. Bowman[1] has indicated the presence of organic muscular fibre in the tissue of the dartos, "at once known by its being loaded with corpuscles or persistent cell-nuclei." The same fibres probably exist in the contractile tissue of the nipple.

8. The papillary layer of the derma (Plate 2, figs. 1, 2,) is raised in the form of conical prominences or papillæ. Upon the general surface of the body the papillæ are short, and exceedingly minute, but in other situations, as on the palmar surface of the hands and fingers, and on the plantar surface of the feet and toes, they are long, and of large size. They are also different in their arrangement in the situations above cited; thus, on the general surface, they are distributed at unequal distances, singly and in groups, whereas, on the palms and soles, and on the corresponding surfaces of the fingers and toes, they are collected into little square clumps, containing from ten to twenty papillæ, and these little clumps are disposed in parallel rows. It is this arrangement, in rows, that gives rise to the characteristic parallel ridges and furrows which are met with on the hands and on the feet. The papillæ in these little square clumps are for the most part uniform in size and length, but every here and there one papilla may be observed which is longer than the rest. The largest papillæ of the derma are those which produce the nail; in the dermal follicle of the nail, they are long and filiform, while beneath the concave surface of the nail they constitute longitudinal and parallel plications (fig. 4) which extend for nearly the entire length of that organ. In structure each papilla is composed of a more or less convoluted capillary, and a more or less convoluted nervous loop.

9. The arteries of the derma which enter its structure through the areolæ of the under surface of the corium, speedily divide into innumerable intermediate vessels, which form a rich capillary plexus in the texture of the superficial strata of the derma, and in its papillary layer. In the former situation the capillary rete is horizontal—that is, it corresponds with the plane of the surface of the skin, while in the papillæ it is necessarily the reverse of this—namely, perpendicular to the plane of the surface. To see the capillary plexus of the papillæ, it consequently becomes necessary to examine the injected skin by means of a vertical section, but if the horizontal rete is to be observed, no section is needed. In the papillæ of some parts of the derma, as in the longitudinal plications beneath the nail, the capillary vessels form simple loops, but in other papillæ they are convoluted to a greater or less extent, in proportion to the size and importance of the papillæ. (Plate 2, figs. 3, 5.) The capillary rete of the horizontal strata presents, as may be inferred, a number of circular areæ, some of which appear to correspond with the bases of the papillæ,

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[1] Cyclopædia of Anatomy and Physiology; Article, Mucous Membrane, Note, page 494.

while the greater number occupy the walls of the passages through which the sudoriferous and sebiferous ducts make their way to the surface. After a certain extent of course, the intermediate vessels unite to form the veins by which the circulated blood returns to the system.

10. The lymphatic vessels probably form, in the superficial strata of the derma, a plexus, the meshes of which are interwoven with those of the capillary and nervous plexus. No lymphatics have as yet been discovered in the papillæ, nor, indeed, can I imagine that they would perform any useful office in that situation. I once succeeded in injecting a minute lymphatic plexus in the derma of a fœtal lamb.

11. The nerves of the derma, after entering the areolæ of the deeper part of the corium, divide into minute fasciculi, and these quickly separate into primitive fibres. Corresponding with the horizontal vascular rete, the nervous fasciculi constitute a nervous rete, from which loops of primitive fibres enter the papillæ. In the less sensitive parts of the skin, the loops are simple, and more or less acute in their bend, in conformity with the figure of the papillæ. In the sensitive parts, however, and especially in the tactile papillæ of the pulps of the fingers, the loop is convoluted to a greater or less extent, and acts as a multiplier of sensation.

12. The epiderma (Plate 1) is a membrane of defence, spread out upon the surface of the derma. As we have previously observed, this membrane presents a difference of density according as it is viewed from its outer or its inner surface; the outer or free surface being dense and horny, the inner or attached surface being soft and composed of cells. Moreover, the epiderma is laminated in its structure, and the laminæ present a progressively increasing density, as they advance from the inner to the outer surface. This difference in density is dependent on the mode of growth of the epiderma, for as the external surface is constantly subjected to destruction by attrition and chemical action, so the membrane is continually reproduced on its internal surface, new layers being successively formed upon the derma, to take the place of the old.

The mode of development and growth of the epiderma I have recently made the subject of careful investigation, and as the results at which I have arrived present a new view of the mode of growth of cells, to that founded on the authority of Schwann, and generally received, I shall make no apology for quoting entire the paper[1] in which these observations are detailed:—

13. "It is the commonly received doctrine at the present day that the cells of the epiderma and of epithelium in general, originate out of materials furnished by the liquor sanguinis or plasma of the blood. In order that this purpose may be effected, the liquor sanguinis is conveyed by endosmosis through the walls of the capillary vessels, and through the peripheral boundary of the surface, the 'basement membrane' of Bowman. Having reached the exterior plane of the latter, the changes commence which result in the development of

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[1] This paper was read before the Royal Society, June 19, 1845.

granules in the previously fluid liquor sanguinis, or rather, perhaps, in the aggregation of the molecules of the organizable material or blastema which was previously held in intimate suspension or solution by the liquor sanguinis. Out of the body, an action of this kind would be termed coagulation, and where inorganic matter is concerned, crystallization: and the process to which I am now referring, though taking place within the body, is analogous to these phenomena, with the difference of being controlled and directed by the power of life, of being, in point of fact, a vital coagulation or crystallization. Indeed, coagulation, though occurring out of the body, and sometimes after the lapse of a considerable period, may be regarded as the last act of vital existence, or as a vestige of the atmosphere of life with which the coagulating fluid was previously charged in abundance.

"As regards the tissue under consideration, there is every ground for belief that the organizable material or blastema of the liquor sanguinis is appropriated by the epiderma the very instant it reaches the exterior plane of the 'basement membrane,' some portion of it and the greater part of the serum of the liquor sanguinis being taken up by the newly formed cells to be transmitted in succession to more superficial ranges of cells, and the remaining portion being converted on the spot into the primitive granules of the tissue. This belief is supported by the fact of the absence of any fluid stratum between the epiderma and the derma, and by the close connexion known to subsist between these two membranes. It is well known that to separate the epiderma from the derma until the former is so thoroughly saturated with fluid by maceration as to have acquired a considerable addition to its dimensions in all directions, or until decomposition has commenced, is next to impossible, and in the living state of the body separation never takes place until the mutual connexion between the layers has been destroyed by the effusion of fluid. The microscope gives additional weight to this evidence; I have observed that the cells of the deep surface of the epiderma are in immediate contact with the boundary limit of the derma, and that, moreover, it is frequently difficult to determine the exact line between them. I have also made the following experiment: I cut very thin vertical slices of the skin at daily periods from the moment of death until decomposition had become established, and submitted them to the action of the compressor beneath the microscope, but in every instance, while fresh, the two tissues yielded to the pressure in equal proportion without any separation occurring. As soon, however, as decomposition had commenced, separation was produced, and in the early stages took place with difficulty. This experiment proves that the firm adhesion subsisting between the epiderma and derma is not alone due to the numerous inflexions of the former into the latter which take place at the sudoriferous tubes, hair tubes, and sebiferous ducts, although these inflexions must co-operate powerfully in the result.

"Being desirous of examining the under surface of the epiderma with the higher powers of the microscope, and failing in all my attempts to effect this object by taking the entire thickness of the epiderma or by scraping, I awaited the first indication of its separation[1] from the derma, and then removing it carefully, made a thin slice parallel with the surface which I wished to examine. This plan succeeded beyond my expectations, for not only did I obtain parts so diaphanous as to enable me to see the surface distinctly, but the septa between the depressions for the papillæ of the derma afforded natural laminæ of such transparency as permitted their structure to be well examined.

14. "When the under surface of the epiderma was exposed to view I found it to be composed of four kinds of elements, arranged in such a manner as to constitute an irregular mosaic plane. These elements are:—1. *granules*, measuring about $\frac{1}{20000}$ of an inch in diameter; 2. *aggregated granules*, measuring about $\frac{1}{10000}$; 3. *nucleated granules*, measuring $\frac{1}{8000}$ to $\frac{1}{4000}$; and 4. *cells*, measuring $\frac{1}{3000}$ to $\frac{1}{2500}$ of an inch. (Plate 1, fig. 8.)

15. "The granules, which I may distinguish by the name of *primitive granules*, are globular in form, homogeneous, solid, brightly illuminated by transmitted light when the centre is under the focus of the microscope, but dark when viewed upon the surface, the darkness being increased whenever they are congregated in clusters. These granules I conceive to be the first organic shape of the blastema of the liquor sanguinis.

16. "The *aggregated granules*, measuring about $\frac{1}{10000}$ of an inch in diameter, are minute masses composed of four, five, or six of the preceding, or as many as can be aggregated without leaving an unoccupied space in the centre of the mass. With an imperfect focus these granules have the appearance of possessing a transparent globular nucleus; but this appearance ceases when the focus is perfect, and then the component granules are quite obvious, and the centre becomes a dark point, namely, the shadow caused by the meeting of the primitive granules.

17. "The *nucleated granules*, measuring between $\frac{1}{8000}$ and $\frac{1}{4000}$ of an inch in diameter, are in point of construction an 'aggregated granule' with a single layer of aggregated granules arranged around it, so as to give the entire mass a circular or oval form. The central 'aggregated granule' has now become a nucleus, and at the same time has undergone other changes which indicate its longer existence. For example, the primitive granules composing it are denser than they were originally, and they are separated from each other by a very distinct interstitial space filled with a transparent and homogeneous matter. Sometimes this interstitial substance presses the granules equally on all sides, constituting a circular nucleus, but more frequently two opposite granules are more widely separated than the rest, and the nucleus receives an elongated form. The interstitial substance is most conspicuous at the line of junction of the nucleus with the secondary tier of 'aggregated granules,' and in this situation gives a defined character to the nucleus. Close observation and a

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[1] It may be necessary to inform those who are unskilled in the manipulations required in pursuing investigations in minute anatomy, that no decomposition had occurred in this case; both epiderma and derma were perfectly fresh, and the separation resulted chiefly from the imbibition of water by the epiderma.

A. S. Ferris.

perfect focus render it quite obvious that the peripheral tier of granules are in reality aggregated. They are lighter than the shaded granules of the nucleus, and apparently softer in texture.

"The nucleated granules are more or less flattened in their form, and present a flat surface of contact with the derma. It is this latter circumstance that gives the facility of determining their mode of construction.

18. "The cells of the deep stratum of the epiderma, measuring $\frac{1}{3000}$ to $\frac{1}{2500}$ of an inch in their longer diameter, are the most striking feature of this layer, and may be said to be its chief constituent. They originate, as is evident from their structure, in the nucleated granules previously described, and consist of a transparent layer added to the exterior of the former. Or, if I might be permitted to describe them as they appear in their tesselated position, they are constituted by the addition of a transparent border to the last described nucleated granule. The periphery of this transparent border is bounded by a dark interstitial substance, which gives the border a defined outline, and in the latter situation I imagine a cell-membrane to exist. I am not satisfied, however, that this is the case, and the difficulty of isolating these cells, and their roughness of outline when separated, seem to prove that if a membrane be really present it must be exceedingly thin and easily torn. Assuming, therefore, from analogy rather than from demonstrative evidence, that there exists a boundary membrane to the bodies I am now describing, I have termed them 'cells;' the cavity of the cell I apprehend to be 'the transparent border;' the 'nucleated granule' is the *nucleus* of the cell; the 'aggregated granule' of the latter, the *nucleolus*, and the entire body a 'nucleolo-nucleated cell.'

"Before quitting the structure of the 'nucleolo-nucleated cell' or primitive cell of the epiderma, there is a point of much interest to be mentioned with regard to it, which is, that the 'transparent border' just described is itself a tier of 'aggregated granules.' The nucleolus, therefore, is an 'aggregated granule,' the nucleus a tier (taking its flat surface) of aggregated granules surrounding the former; and the cell-chamber a tier of aggregated granules inclosing the whole.

19. "To return to the mosaic-like plane of the under surface of the epiderma: the largest of the pieces composing this plane are the nucleolo-nucleated cells. These are placed without order; in some parts closely pressed together, in others at short distances apart, and here and there leaving interspaces between them equal to the breadth of the cells. The interspaces or intercellular spaces are occupied by the 'nucleated granules,' 'aggregated granules,' and 'primitive granules,' irregularly set in a homogeneous interstitial substance, which fills up all vacuities. The granules and interstitial substance modify the light transmitted through them variously at different foci of the microscope; sometimes the granules look dark while the interstitial substance is light, and sometimes the reverse is the case.

"Such is the structure of the mosaic-like plane of the under surface of the epiderma, and, so far, my observations having reference to facts, are demonstrable, and admit of being spoken to positively. The interpretation of the facts I would willingly leave to others, but feel that I am called upon to state any opinion, founded on the above observations, that I may have formed of the signification of these appearances. In the first place, then, I must acknowledge myself wholly divided between a belief in the possibility of formation of the 'aggregated granule,' by the *aggregation of primitive granules*, the idea which prompted me to give it that name, and the formation of the 'aggregated granule' by the *cleavage of a primitive granule.* If this question related merely to the formation of the 'primary aggregated granule' it would be unimportant, but it has a more extended application. The outermost layer of the mucleus is composed, as I have shown, of aggregated granules, and so also is that layer which alone forms the chamber in the nucleolo-nucleated cell. To these the hypothesis of cleavage of a simple granule would be most suitable, and this theory would explain, better than any other, changes which remain to be described in the further growth of the epidermal cell. In the second place, the relation of cell and nucleus is a question on which I feel considerable doubt. The process of development appears to consist in the successive production of granules, one layer of granules succeeding another, so that, if the organizable principle exist in each separate granule, the organizable force may be supposed to be more and more weakened in successive formations until the moment arrives when it ceases entirely. Is that which I have described as a 'nucleolo-nucleated cell' really a cell or still a nucleus? The only solution to the question that occurs to me is, determining the presence of a cell-membrane, in which I have not satisfactorily succeeded.

20. "Admitting the nucleolo-nucleated bodies now described to be cells in their earliest state of formation, their size is $\frac{1}{3000}$ to $\frac{1}{2500}$ of an inch in the long diameter, and that of their nucleus from $\frac{1}{5000}$ to $\frac{1}{4500}$ of an inch. In the stratum immediately above the deepest layer I find cells measuring $\frac{1}{2000}$ of an inch with nuclei of $\frac{1}{4500}$. Above these, cells measuring $\frac{1}{1800}$, with nuclei varying from $\frac{1}{4000}$ to $\frac{1}{3000}$, and above the latter, cells measuring $\frac{1}{1500}$ with nuclei of $\frac{1}{2500}$. In following the layers of epiderma upwards to the surface, cells may be observed possessing every intermediate degree of size between the last named cell, namely, $\frac{1}{1500}$, and $\frac{1}{500}$, which is the measurement of the scales which constitute the uppermost stratum of the epiderma. It must not be supposed, however, that the growth of the epidermal cells reaches its maximum only at the surface; I have found cells of that magnitude in the deeper strata, and there is every indication of the growth of these cells being completed in the stratum immediately above the mosaic-like layer.

21. "Young cells are remarkable for the large size of the nucleus as compared with the entire bulk of the cell, and it is quite evident also that the nuclei, up to a certain point, grow with the cells; their mode of growth appearing to be the separation of the original granules by the deposition between them of interstitial matter, and in addition, as I believe, by cleavage and the consequent multiplication of the granules; in cells measuring $\frac{1}{2000}$ and $\frac{1}{1800}$ of an inch, I found the granular character of the nucleus to be very manifest. Besides

growth, it is apparent that other changes are taking place in the nucleus; imbibition and assimilation of organizable material must necessarily be in action in order to accomplish the formation of interstitial matter; but, in addition to this, the central granules undergo another change, by which they are altered in character, and become distinguished from the rest when submitted to chemical experiment. For example, when diluted acetic acid is added to the cells measuring $\frac{1}{2000}$ of an inch and less, the entire nucleus is rendered transparent and less discernible than before; but when cells of a somewhat larger size, and consequently longer growth, are submitted to the same process, the nucleus is rendered much more distinct than it was previously. But the body which is made so conspicuous in this latter experiment is not the entire nucleus, but simply the central and older granules of the nucleus; the younger granules retain the character of those of the young cells: they are made more transparent than they were before, and have faded from sight. I may mention, also, that the nucleus brought into view by the acetic acid is more or less irregular in form, and has the appearance of being constituted by the fusion of the original granules. How much of this appearance may be real, and how much the effect of the acid, I do not pretend to say; and I set no value on the experiment beyond the demonstration of the mere fact which it is made to illustrate.

22. "I now turn to the growth of the cells: I have remarked, in an earlier paragraph, that the formation of the young cell appears to be due to the development of a stratum of 'aggregated granules' externally to the nucleated mass which I have regarded as the cell-nucleus. Now, nothing is more certain than that the growth of the cell is due to a successive repetition of this process; the growth of the cell-membrane being consentaneous with the development and growth of aggregated granules within it. In cells of $\frac{1}{1800}$ to $\frac{1}{1500}$ of an inch, the aggregated granules of the periphery are not easily discernible, but in cells measuring $\frac{1}{1000}$ and thence upwards to the complete size of the epidermal cell, the fact is quite evident, and is apparent even in the cell-scale. Indeed, a cell at the full period of growth is a kind of cell microcosm, containing in its interior, secondary cells, tertiary cells, nucleolo-nucleated cells, nucleated granules, aggregated granules, and primitive granules.

23. "It will be observed that this hypothesis of cell growth differs from that of Schwann. The theory of Schwann always appeared to me to be incompetent to the explanation of the growth of the large scale of epiderma and epithelium in a tissue manifestly subjected to considerable pressure. I sought in vain for the watch-glass cells, elliptical cells, and globular cells in the epiderma, and my search has been rewarded by the discovery of the above-described beautiful process of formation and growth. It will be seen that, according to this view of the growth of epidermal cells, they never possess any thing approaching to a globular form, that the scales are not flattened spheres, but, on the contrary, always possessed a flattened form, and have increased by a peripheral growth. This mode of growth, again, is made manifest by the observation of a vertical section of the epiderma. The most care-

ful examination can distinguish no difference between the size of the deeper and superficial strata of cells: they have all the same average thickness, all the same average length—an appearance easily explained, when we regard them as parent cells, containing secondary and tertiary cells of the same average size as the cells of earlier formation. It is true, that the complete size of the cell is very quickly attained, and that its growth, taking place in the deepest stratum of the epiderma, could not be expected to produce any difference of character in the middle and superficial strata, but this is not mentioned, as far as I know, by Schwann.

24. "The process of growth here described explains also the fact of the disappearance of the nucleus in the scales of the epiderma. The outermost granules of the nucleus have become the nuclei or nucleoli of secondary cells, and have consequently been moved away from their original position in the performance of the office of centres of growth to secondary cells. The original nucleus, therefore, is not lost, but merely robbed of some of its component granules, which may be discovered in many parts of the epidermal scale, instead of being concentrated in a single mass. In these scales, and particularly in epithelial scales, the central and denser part of the original nucleus is generally perceptible: in the latter it constitutes the scale-nucleus, and in the epidermal scale there is always some one little mass larger than the rest, particularly if the scale have been for some time immersed in fluid, as when it is examined in the serum of a blister. In an epidermal scale, measuring $\frac{1}{800}$ of an inch in long-diameter, I found several secondary cells measuring $\frac{1}{1800}$, others measuring $\frac{1}{5808}$ and in the interstices, primitive granules, aggregated granules, and nucleated cells.

25. "My observations, it will be seen, have been chiefly directed to the epiderma, and I am prevented at present from carrying them further; but I have no doubt that the epithelium will be found to be identical, in the phenomena of development and growth, with the epiderma. I have observed the same structure in the epithelium of the mouth and fauces, and also in that of the bladder and vagina. Incomplete epithelial cells from the fauces, measuring $\frac{1}{750}$ and $\frac{1}{708}$ of an inch, presented a very remarkable appearance; they have a rounded lobulated border, evidently composed of a row of secondary cells, and a depressed centre, as though the action were subsiding in the latter while it was progressing in the circumference.

26. "Another illustration of the structure now described, I found in the cells of melanosis, and in the pigment cells of the choroid membrane of the eye-ball, and I am induced to believe that the same structure will be discovered more extensively than at present can be anticipated. The corpuscles of melanosis, according to my observation, are parent cells having an average measurement of $\frac{1}{1000}$ of an inch, containing secondary cells and nucleated and aggregated granules, as well as separate primitive granules. The aggregated granules measured from $\frac{1}{11000}$ to $\frac{1}{7000}$ of an inch, and the primitive granules about $\frac{1}{20000}$.

27. "There is another feature in the history of development of

the epidermal cell, which I regard as peculiarly interesting. This relates to an organic change taking place in the assimilative powers of the primitive granules, by which the latter are altered in their colour, in short, are converted into 'pigment granules.' Pigment granules appear to differ in no respect from the primitive granules, excepting in tint of colour and chemical composition. They have the same globular form, the same size, and occupy the same position in the cell, being always accumulated around the nucleus, and dispersed less numerously through the rest of the cell. The nucleus of the cell in the epiderma of the negro appears to consist wholly of pigment granules; while, in the European, there is a greater or less admixture of coloured and uncoloured granules. The central granules are generally lighter in tint than the rest, and give the idea of a colourless nucleolus, while those around the circumference are more deeply coloured. Besides a difference in the depth of colour of the separate granules entering into the composition of a single cell, there is also much difference in the aggregate of the granules composing particular cells. For example, intermingled with cells of a dark hue, there are others less deeply tinted, which give the tissue in which they are found a mottled appearance. This fact is well illustrated in the hair and also in the nails; in which latter it is no uncommon thing to find an isolated streak produced by the accumulation of a number of cells containing coloured granules in the midst of colourless cells.

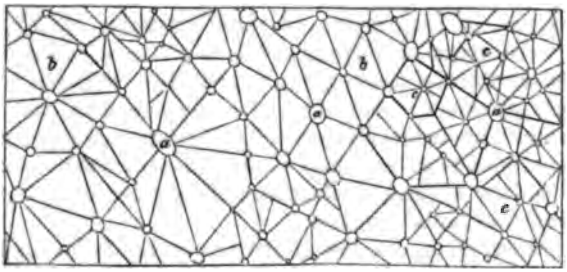
28. "When pigment granules are examined separately, they offer very little indication of the depth of colour which is produced by their accumulation. I have observed some to have the hue of amber, while others scarcely exceeded the most delicate fawn. The depth of colour of the deep stratum of the epiderma in the negro is evidently due to the composition of that layer, of these granules chiefly, while the grayness of the superficial layers of the same tissue results not merely from the desiccation of these granules, but also from the fact of those subsequently produced being less strongly coloured, and also from the addition of a considerable mass of colourless cell membrane. The epidermal scale of the negro has a mottled appearance, from the numerous secondary nuclei and their attendant coloured granules, which are scattered through its texture."

29. It follows, from a review of the structure of the epiderma, that this membrane is accurately modelled on the papillary layer, that each papilla finds its appropriate sheath in the newly-formed epiderma or rete mucosum, and that each irregularity of surface of the former has its representative in the soft tissue of the deep layers of the latter. (Plate 1, figs. 2, 5.) It is not, however, the same with the external surface of the epiderma; this is modified by attrition and exposure to chemical and physical influence; the minute elevations, corresponding with the papillæ, are, as it were, polished down, and the surface is consequently rendered smooth and uniform. The palmar and plantar surfaces of the hands and feet are an exception to this rule, for in these situations, in consequence of the large size of the papillæ, and their peculiar arrangements in rows, ridges corresponding with the papillæ are strongly marked on the superficial surface of the epiderma.

(Plate 1, fig. 1.) Moreover, upon the borders of the fingers, where the linear-disposed and magnified papillæ of the palmar surface gradually pass into the irregular and minute papillæ of the dorsal surface, a transition state of the epiderma may usually be observed.

30. Besides the form bestowed upon the epiderma by its relation with the derma, its degree of thickness will be found to be dependent upon the same source, and to bear an accurate proportion to the degree of development of the papillæ. Thus, on the palms[1] of the hands, where the papillæ are large, the epiderma is thick; while on the backs of those organs, or on the scalp, where the papillæ are small, it is exceedingly thin.

31. Another character presented by the epiderma is also to be considered as the consequence of its connexion with and dependence on the derma—namely, the network of linear furrows, which every where intersect each other, and trace out the surface into small polygonal and lozenge-shaped areæ. These lines correspond with the folds of the derma produced by its movements, and are most numerous where those movements are greatest, as in the flexures, and on the convexities of joints. Some difference is perceived in the form of the areæ, when examined in these two situations; thus in the flexures of the joints they are narrow and long, and, for the most part, lozenge-shaped in their figure, while on the convexities of joints, as upon the elbow and knee, the areæ are large, and more nearly quadrangular. The furrows of the epiderma admit of a division into two kinds—namely, those which correspond with joints, and bear relation to the movements of the body and limbs, and those which belong especially to the movements of the skin. The first or larger kind are those which are so perceptible on the flexures and convexities of joints, and on the palm of the hand and sole of the foot. The latter or smaller occupy the interspaces of the former, and those parts of the surface where the furrows of articular motion have no existence. Their plan of arrangement is as follows:—from each of the hair-pores (*a*, *a*) there pass off on all sides, like rays from a centre, from six to ten lines, which meet by their extremities lines proceeding from other pores. These lines mark out the surface into small triangular spaces (*b*, *b*) or areæ, within which are other and more minute pores, probably perspiratory pores. From the latter, a similar number of radiating



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[1] In an individual not exposed to much manual labour, I found the epiderma in the palm of the hand to measure one fourth of a line in thickness.

lines are given off, and abut against the coarser lines, dividing the surface into smaller triangular areæ (*c*, *c*,) and giving to the entire network the appearance of a number of nicely adjusted angular wheels. On the shoulder of a child of about five years of age, I counted sixty of the hair-pores with the wheel-like rays within the limit of a square inch; while between these larger pores were six hundred smaller pores, constituting so many secondary centres and secondary wheels, and forming an elegant mosaic pattern. On the scalp, the furrows run between the hair-pores, and the included areæ are more open than on the general surface of the skin.

32. The deeper tint of colour of the skin observable among the nations of the south, and in certain regions of the skin of the European, is due to the presence of pigment granules in the cells of the epiderma. The pigment bearing cells are most abundant in the furrows of the derma, and in the hollows between the papillæ. The production of pigment granules is not, however, limited to the horizontal stratum of the derma, they are also met with in the various inflections of the epiderma, constituting sudoriparous and sebiparous glands, and hair-follicles. It is in consequence of the presence of these granules in the cells constituting these inflections that we are enabled to perceive the organs to which they belong with greater facility; and, for the same reason, we discover pigment granules in the perspiratory and sebaceous secretions.

33. The chemical composition of the pigment of the skin may be inferred from the analysis of the pigmentum nigrum oculi made by Scherer.[1] The principal elementary substances composing this pigment, and the epiderma, were found in the following proportions:—

	Pigment.		Epiderma.
Carbon	58·27	...	50·34
Hydrogen	5·97	...	6·81
Nitrogen	13·76	...	17·22
Oxygen	21·98	...	25·63

The proximate composition of the epiderma, according to an analysis by John, is as follows:—

Hardened albumen . .	93·0 to 95·0
Gelatinous matter . .	5·0 "
Fat	0·5 "
Lactic acid; salts and oxides	1·0 "

The salts are, lactate, phosphate, and sulphate of potash; sulphate and phosphate of lime; and sulphate and phosphate of ammonia; the oxides, those of manganese and iron.

34. The identity of structure of the external tegument or skin, with the internal tegument or mucous membrane, has long been established. In both, the same parts are found, and each is continuous with the other. Mr. Bowman, of King's college, whose remarks, founded on careful and persevering observation, are always important and deserving of attention, again directs our notice[2] to this fact, and adduces another point of similitude between these membranes. He

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[1] Liebig's Organic Chemistry.

[2] Cyclopædia of Anatomy and Physiology; Article, Mucous Membrane.

finds beneath the epithelium of mucous membranes, on the one hand, and in contact with the vessels of the parenchyma, on the other, "a simple, homogeneous expansion, transparent, colourless, and of extreme tenuity;" this delicate expansion serves as a foundation on which the epithelium rests; and in accordance with this view he terms it the "*basement membrane.*" This is, in fact, the boundary layer of all vascular membranes, and as such is met with in serous as well as in mucous structures. The extreme tenuity of the basement membrane may be inferred from the measurements instituted by Mr. Bowman: in the uriniparous tubuli, its thickness does not exceed $\frac{1}{20000}$ of an inch; in the seminiparous tubuli, it is $\frac{1}{10000}$ of an inch in thickness; in the lungs, it forms almost the entire thickness of the air-cells; and in no situation has it been found to exceed $\frac{1}{8000}$ of an inch. Reasoning from analogy, Mr. Bowman infers the existence of a corresponding membrane on the surface of the derma, an inference that will be unreservedly accorded him; but he finds it difficult to demonstrate this membrane in the latter situation, in consequence of its close adherence to the vascular rete, and deeper seated strata. The same difficulty exists on the general surface of the mucous membranes, and for the same reason; but, in the minute tubuli of the secreting glands, the connexion between the basement membrane and the vascular rete is so slight, that they separate on the gentlest pressure. In like manner Mr. Bowman finds no difficulty in distinguishing this membrane in the tubuli of the sudoriparous and sebiparous glands. Mr. Bowman remarks, that it is the basement membrane which gives firmness and form to the minute tubuli of secreting glands.

35. The SUDORIPAROUS GLANDS (Plate 2, fig. 3,) are situated in the middle and deeper stratum of the corium, namely, at about half a line below the plane of the upper surface of the epiderma. They are small, oblong bodies, composed of one or more convoluted tubuli,[1] or of a congeries of globular sacs,[2] which open into a common efferent duct, and the latter ascends through the structure of the derma and epiderma, to terminate by a funnel-shaped and oblique aperture or pore upon the surface of the latter. The sudoriparous glands are various in size in different parts of the body; for example, in the palm of the hand I found them to range between $\frac{1}{200}$ and $\frac{1}{100}$ of an inch in their longest diameter; while in the axillæ they measured between $\frac{1}{90}$ and $\frac{1}{60}$ of an inch. The entire length of each tubulus, comprising that which constitutes the gland, as well as the excretory duct, is about one quarter of an inch. The efferent duct presents some variety in its course upwards to the surface. Below the derma it is curved and serpentine, and having pierced the derma, if the epiderma be thin, it proceeds more or less directly to the excreting pore. Sometimes it is spirally curved beneath the derma, and having passed the latter, is regularly and beautifully spiral in its passage through the epiderma, the last turn forming an oblique and valvular opening on the surface. The spiral course of the duct is especially remarkable in the thick epiderma of the palm

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[1] Muller. Giraldès, 1841. [2] Gerber.

of the hand and sole of the foot. In those parts of the body where the papillæ of the derma are irregularly distributed, the efferent ducts of the sudoriparous glands open on the surface also irregularly, while on the palmar and plantar surfaces of the hands and feet, the pores are situated at regular distances along the ridges, at points corresponding with the intervals of the small square-shaped clumps of papillæ. (§ 8, Plate 1, fig. 1; Plate 2, fig. 1.) Indeed, the apertures of the pores seen upon the surface of the epidermal ridges give rise to the appearance of small transverse furrows, which intersect the ridges from point to point. On the palm of the hand and palmar surface of the fingers the sudoriferous pores are situated at about one-sixth of a line apart along the ridges, and at a little less than a quarter of a line from ridge to ridge. On the heel there are four and a half pores in the compass of a line along the ridge, and three and a half across the ridges.

36. The efferent duct and the component sacs and tubuli of the sudoriparous gland are lined by an inflection of the epiderma. This inflection is thick and infundibiliform in the upper stratum of the derma, but soon becomes uniform and soft. The infundibiliform projection is drawn out from the duct when the epiderma is removed, and may be perceived on the under surface of the latter as a nipple-shaped cone. (Plate 1, fig. 2.) A good view of the sudoriferous ducts is obtained by gently separating the epiderma of a portion of decomposing skin; or they may be better seen by scalding a piece of skin, and then withdrawing the epiderma from the derma. In both these cases it is the lining sheath of epiderma which is drawn out from the duct.

The epidermal lining of the efferent duct (Plate 3, fig. 17,) and secreting sacs of a sudoriparous gland is composed of cells of a polyhedral form, closely packed together, and containing granular nuclei of large size. The average diameter of the tubular epidermal lining of a sudoriferous duct examined in the palm of the hand was $\frac{1}{700}$ of an inch, two-thirds of this diameter being constituted by the wall of the tubule, and the remaining third by its area. The parietes of the tubule were composed of two or three layers of cells, of which the most external, namely, those which corresponded with the corium, measured $\frac{1}{3000}$ of an inch in diameter.

Taken separately, the little perspiratory tube, with its appended gland, is calculated to awaken in the mind very little idea of the importance of the system to which it belongs; but when the vast number of similar organs composing this system are considered,—for it includes the sebiparous organs, which are also agents in perspiration,—we are led to form some notion, however imperfect, of their probable influence on the health and comfort of the individual. I use the words "imperfect notion," advisedly, for the reality surpasses imagination and almost belief. To arrive at something like an estimate of the value of the perspiratory system in relation to the rest of the organism, I counted the perspiratory pores on the palm of the hand, and found 3528 in a square inch. Now, each of these pores being the aperture of a little tube of about a quarter of an inch long, it follows, that in a square inch of skin on the palm of the hand there exists a length of tube equal to 882 inches, or 73½ feet. On the pulps of the fingers, where the ridges of the sensitive layer of the true skin are somewhat finer than in the palm of the hand, the number of pores on a square inch a little exceeded that of the palm; and on the heel, where the ridges are coarser, the number of pores on the square inch was 2268, and the length of tube 567 inches, or 47 feet. To obtain an estimate of the length of tube of the perspiratory system of the whole surface of the body, I think that 2800 might be taken as a fair average of the number of pores in the square inch, and 700, consequently, of the number of inches in length. Now, the number of square inches of surface in a man of ordinary height and bulk is 2500; the number of pores, therefore, 7,000,000, and the number of inches of perspiratory tube 1,750,000, that is, 145,833 feet, or 48,600 yards, or nearly twenty-eight miles.

SEBIPAROUS SYSTEM.

37. The SEBIPAROUS GLANDS (Plate 3) are small lobulated organs embedded in the substance of the derma, and furnished with excretory ducts, which open in some instances on the surface of the epiderma, but more frequently into the hair-follicles. They offer considerable variety in point of shape and size, some being more or less globular, and others arborescent, palmated, pear-shaped, or racemiform. The excretory duct is not less remarkable for variety; it is generally capacious and pouch-like, but sometimes is slender and tortuous, like the sudoriferous ducts, and occasionally assumes a spiral course. Like other conglomerate secreting organs, the sebiparous gland is composed of lobes, and the latter of lobules. The ducts of the lobules unite to form a single duct for each lobe, and the lobe ducts terminate in the main excretory duct. Sometimes the ducts of two glands issue in a single excretory tube, and occasionally three, four, and five terminate in the same manner. On the scalp there are two (sometimes more) sebiparous glands to each hair-follicle; they are small, of the racemiform, pyriform, or palmated kind, and are situated at about $\frac{1}{30}$ of an inch below the plane of the surface of the derma. The sebiparous glands of the nose are large and of the arborescent type; their ducts are also large, and frequently distended with sebaceous substance, and the peculiar animalcules (steatozoon folliculorum, Plate 3, fig. 13) of these organs. Occasionally, a duct may be observed which is of remarkable size from distention, while the gland is disproportionately small. The sebiparous glands of the meatus auditorius, the ceruminous glands (fig. 11,) are somewhat smaller than those of the nose; they are arborescent, or divided into large lobes, and the entire gland is more or less flattened upon its superficial and deep aspect, so as to accord with the thinness of the derma in that situation. It is the solitary sebiparous glands which attain the large size now described; those connected with the hair follicles are generally much smaller, and their shape for the most part is pyriform or racemiform. The sebiparous glands situated around the verge of the anus are also of considerable size, but the largest of all are those of the eyelids, the Meibomian glands. The Meibomian glands (fig. 12) consist of a central excretory duct, into which numerous small sacculated lobules

open upon all sides, by means of short pedunculated ducts; they have an exceedingly elegant arrangement under the transparent mucous membrane of the inner surface of the eyelids. The sebiferous ducts and glands are lined by an inversion of the epiderma, which forms a thick and funnel-shaped cone at its commencement, but soon becomes uniform and soft. The structure of the epidermal lining of the sebiferous tubes is identical with that of the sudoriferous ducts. (§ 36.) Sebiparous glands are met with in all parts of the body, but are most abundant in the skin of the face, and in those situations which are naturally exposed to the influence of friction, and where at the same time the epiderma is thin.

HAIRS.

38. Hairs (Plate 4) are horny appendages of the skin, produced by the involution and subsequent evolution of the epiderma; the involution constituting the sheath of the follicle in which the hair is enclosed, and the evolution, the body of the hair. A hair admits of a natural division into a central portion, or shaft, and two extremities, —a peripheral extremity, the point, and a central extremity, the bulb, or root. The shaft of a hair is rarely perfectly cylindrical in figure, being for the most part compressed upon its sides, and generally oval or fabiform in it section. The celebrated Leeuwenhoeck observed this diversity of form, and remarks, "quot crines, tot figuræ." The hair also offers much variety in point of size. For example: in 2000 hairs, taken from 38 persons, the finest ranged between $\frac{1}{1500}$ and $\frac{1}{500}$ of an inch; the former of these occurring in three instances, one in black, the others in brown hair, the subjects of the observation being adult men; the latter, in seven persons, two men with black hair, and five women, four with brown and one with chestnut hair. The coarsest hairs in the same heads ranged between $\frac{1}{400}$ and $\frac{1}{140}$ of an inch, the former being the flaxen hair of a female child, and the latter, a brown hair from the head of a female adult. In three South American Indians, a man, a young woman, and a child, the finest hair occurred in the child ($\frac{1}{1000}$ of an inch,) next in the man $\frac{1}{500}$, and lastly in the woman ($\frac{1}{450}$.) The coarsest hairs of the same individuals were $\frac{1}{240}$ of an inch in the man and woman, and $\frac{1}{210}$ in the child. The colour of the hair in the two former was black, and that of the child red. In a New Zealand Chief, the finest of fifty hairs measured $\frac{1}{450}$ and the coarsest, $\frac{1}{200}$ of an inch. The influence of a morbid habit on the hair is shown in the instance of a scrofulous female child; of ninety-seven of the flaxen hairs of this child, the finest measured $\frac{1}{1750}$ and the coarsest $\frac{1}{450}$ of an inch. For convenience of reference, I have arranged these measurements in a tabular form, as follows:—

	Number of hairs examined.	Finest.	Coarsest.
British	2000[1]	$\frac{1}{1500}$-$\frac{1}{500}$	$\frac{1}{400}$-$\frac{1}{140}$
South American Indians	155	$\frac{1}{1000}$-$\frac{1}{450}$	$\frac{1}{240}$-$\frac{1}{210}$
New Zealander . .	50	$\frac{1}{450}$	$\frac{1}{200}$
Scrofulous child . .	97	$\frac{1}{1750}$	$\frac{1}{450}$

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[1] The measurements were in all cases made as close to the head as possible.

39. The average thickness of the 2000 hairs above examined, ranged between $\frac{1}{550}$ of an inch, the flaxen hair of a female child, and $\frac{1}{250}$ of an inch, the brown hair of an adult woman. The average thickness of the hairs of the three South American Indians was $\frac{1}{450}$ of an inch in the child, $\frac{1}{350}$ in the woman, and $\frac{1}{300}$ in the man. The average measurement of the hair of the New Zealand chief was $\frac{1}{350}$, and that of the scrofulous child, $\frac{1}{600}$ of an inch. In a tabular form, these measurements would stand as follows:

British	$\frac{1}{550}$ to $\frac{1}{250}$
South American Indian . .	$\frac{1}{450}$ to $\frac{1}{300}$
New Zealander	$\frac{1}{350}$
Scrofulous child	$\frac{1}{600}$

The average dimension in thickness of human hair, according to the above table, is $\frac{1}{400}$ of an inch. Leeuwenhoeck and Rosenmüller state it to be $\frac{1}{600}$ of a Paris inch,[1] which is certainly too little; while Weber approaches more nearly to the measurements given above, as may be seen by the following table:—

His own hair	$\frac{1}{555}$ to $\frac{1}{370}$	Paris inch.
Mulatto	$\frac{1}{450}$ to $\frac{1}{279}$	"
Senegambian negro, woolly	$\frac{1}{714}$ to $\frac{1}{303}$	"
Nubian Negress	$\frac{1}{525}$ to $\frac{1}{284}$	"

Rosenmüller's table is as follows:—

Adult	$\frac{1}{600}$ to $\frac{1}{400}$	Paris inch.
Child	$\frac{1}{500}$ to $\frac{1}{700}$	"
Lanugo from body of fœtus	$\frac{1}{1600}$	"

It is probable that these writers deduce their average from extremes of measurement, a proceeding that must necessarily lead to error. A correct average can only be obtained by ascertaining the medium range, and deducing the average from that range. See § 41.

40. With respect to the influence of age and sex upon the thickness of the hair, my observations are in favour of the coarsest hair being found in the female, and the finest in the male; and of the hair of children being finer than that of the adult, thus:—

	Number of heads.*	Number of hairs.	Range of thickness.
Child	6 . . .	269 . . .	$\frac{1}{550}$-$\frac{1}{400}$
Man	18 . . .	1016 . . .	$\frac{1}{525}$-$\frac{1}{300}$
Woman . . .	18 . . .	940 . . .	$\frac{1}{500}$-$\frac{1}{250}$

This is the reverse of what might have been anticipated; I should certainly have looked for a coarser hair in the male than in the female, for, independently of sex, the habit of cutting the hair closely might fairly have been expected to conduce to its greater strength. Indeed, in one of the cases examined, the head had been repeatedly shaven with a view to render it strong, but the hair did not exceed the medium average of size.

41. The variety in the thickness of the hairs of the same head is very considerable, as may be perceived in the following instances, taken without selection from a number of observations:

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[1] A Paris inch is one-fifteenth longer than an English inch.

Number of hairs.	Finest.	Coarsest.	Medium range.	Average.
67	$\frac{1}{1500}$	$\frac{1}{235}$	$\frac{1}{250}$-$\frac{1}{550}$	$\frac{1}{450}$
81	$\frac{1}{1500}$	$\frac{1}{300}$	$\frac{1}{350}$-$\frac{1}{600}$	$\frac{1}{400}$
79	$\frac{1}{1255}$	$\frac{1}{230}$	$\frac{1}{350}$-$\frac{1}{750}$	$\frac{1}{450}$
97	$\frac{1}{755}$	$\frac{1}{250}$	$\frac{1}{300}$-$\frac{1}{350}$	$\frac{1}{400}$
57	$\frac{1}{350}$	$\frac{1}{210}$	$\frac{1}{230}$-$\frac{1}{270}$	$\frac{1}{250}$
64	$\frac{1}{500}$	$\frac{1}{240}$	$\frac{1}{300}$-$\frac{1}{400}$	$\frac{1}{400}$

The "medium range" in this table includes the measurements within which the greatest number of hairs are found, and from it the average is deduced.

42. Variety in thickness is not, however, confined to the different hairs of a single head; it is met with even in a single hair. Thus, a hair six inches long, and apparently of uniform dimensions, ranged between $\frac{1}{500}$ and $\frac{1}{320}$ of an inch at various points of its length; another ranged between $\frac{1}{400}$ and $\frac{1}{190}$; while a white hair, which was obviously enlarged at short distances, presented a range of $\frac{1}{450}$ to $\frac{1}{230}$, the diameter of its point measuring $\frac{1}{3000}$ of an inch. The short hairs of the body not unfrequently exhibit an appearance which may be termed varicose. In the instance of the long hairs of the head, a small share of the difference of diameter may be referred to overstretching in dressing the hair, but this cause cannot apply in the case of the varicose hairs. It has been shown by experiment that hair is so elastic that nothing but inordinate stretching could occasion the permanent constrictions to which my admeasurements refer. Weber found a hair ten inches long stretch to thirteen inches, and a hair stretched one-fifth returns to within one-seventeenth of its original length.

43. With respect to colour as a condition associated with diversity in thickness, my observations tend to show that flaxen is the finest, and black the coarsest hair. Gray hairs commonly represent in thickness the colour which they succeed; but as a general rule, the white hairs which intrude themselves as age advances, are coarser than the hairs among which they are found, suggesting the inference, that deficiency of pigmentary is compensated by excess of albuminous principle.

The most extensive range in thickness is enjoyed by light brown hair. The average measurements of hairs of different colours are as follow:—

Flaxen	$\frac{1}{550}$ to $\frac{1}{400}$	of an inch.
Chestnut	$\frac{1}{525}$ to $\frac{1}{350}$	"
Red	$\frac{1}{450}$ to $\frac{1}{400}$	"
Dark Brown	$\frac{1}{500}$ to $\frac{1}{300}$	"
Light Brown	$\frac{1}{500}$ to $\frac{1}{250}$	"
White	$\frac{1}{450}$ to $\frac{1}{300}$	"
Black	$\frac{1}{400}$ to $\frac{1}{350}$	"

These observations accord with those of Withof.

44. The hairs of different regions of the body of the same individual necessarily present some degree of variety of diameter, but the amount of variation is less than might have been anticipated, as may be seen by the following table, in which the average term is employed. The diameter of the hair of the head is given in the first line as a standard of comparison.

	Man, chestnut.	Man, black.	Man, brown.	Woman, brown.
Head	$\frac{1}{125}$	$\frac{1}{350}$	$\frac{1}{400}$	$\frac{1}{250}$
Beard	$\frac{1}{200}$	$\frac{1}{200}$	—	—
Eyebrow	$\frac{1}{250}$	—	$\frac{1}{300}$	—
Pubes	$\frac{1}{300}$	$\frac{1}{250}$	—	$\frac{1}{200}$
Breast	—	$\frac{1}{250}$	$\frac{1}{400}$	$\frac{1}{400}$
Whisker	$\frac{1}{300}$	$\frac{1}{250}$	—	—
Eyelashes	—	$\frac{1}{300}$	—	—
Axilla	$\frac{1}{450}$	$\frac{1}{300}$	—	$\frac{1}{350}$
Thigh	—	$\frac{1}{400}$	—	—
Leg	$\frac{1}{600}$	$\frac{1}{450}$	—	—
Vibrissæ auris	$\frac{1}{1250}$	—	—	—

45. The entire cutaneous surface, with the exception of the palms of the hands and soles of the feet, is organized for the production of hairs. Upon the greater part of the body the hairs are very minute, (downy hairs, lanugo,) and in many situations are not apparent above the level of the skin; in others, as upon the outer sides of the limbs, they attain a certain length, and upon the head, face, pubes, perinæum, axillæ, and around the nipple, their length is considerable. When left to its full growth; as it is in the female, the hair attains a length of from twenty inches to a yard, the latter being regarded as unusually long; but in an instance that lately came under my notice the hair measured six feet. The hair is known, besides, to constitute a sexual character, appearing for the first time on certain parts of the body at the period of puberty, and existing on regions of the body of the male where it is generally imperceptible in the female, as upon the sides of the face, the chin, the breast, the shoulders and the abdomen.

46. The free extremity or point of a hair is conical and more or less sharp. When examined in one of the minute or downy hairs which has not risen above the level of the surface, the point appears obtuse, on account of its little difference in diameter from that of the shaft. (Plate 3, fig. 18.) In the short hairs of the body and on the head, on the other hand, the point is apparently sharper, from the greater relative size of the shaft, and actually so as a consequence of desiccation. The pointed character of a hair is very perceptible in the eyebrows and eyelashes, and in the vibrissæ of the nose and meatus auditorius. When the hair has been cut, its pointed character is necessarily lost. Sometimes, however, there is an appearance of pointing, the combined result of attrition and desiccation. But the more usual character, when the hair has been long neglected, is a splitting of the end into two or three filaments.

47. The root of a hair is somewhat larger than the shaft, and forms the summit of an oval-shaped mass of considerable magnitude, the pulp. When the hair is cast as a process of decay, the root is pointed, and resembles an old paint brush worn to a conical stump. (Plate 3, fig. 18.) But when it is torn out by force it presents a variety of appearances, depending on the removal with it of more or less of the epidermal lining of the follicle. Sometimes this follicular sheath is collected in a mass at the extremity of the hair, and the latter appears, in consequence, to be bulbous. Sometimes the epidermal sheath is drawn to a greater or less extent beyond the root, and then ac-

cording as it is straight or curved in direction, the root has the appearance of being pointed or uncinated.

48. In structure, a hair is composed of three different tissues (Plate 4, fig. 3,)—namely, of a loose cellulated tissue, which occupies its centre, and constitutes the medulla or pith; a fibrous tissue, which encloses the preceding, and forms the chief bulk of human hair; and a thin layer of superimposed scales, which envelops the fibrous structure and forms the smooth, external surface of the hair.

49. The medulla is absent in the minute or downy hairs, and is not unfrequently absent or small in quantity in fine hairs, from whatever region they are selected. In the coarser hairs of the head and of the body, on the other hand, it is always present, and it is especially remarkable in gray hair. It varies in breadth from a mere line to a cylindrical body of one-third the diameter of the hair, and is composed of large nucleated cells, of a globular or oval figure, filled with granules and packed together, apparently without order. When newly formed, these cells, with their granules, are distended with fluid, but in the shaft of the hair the cells frequently contain air, which, from its highly refractive powers, gives the medulla a dark appearance when examined with the microscope. Varieties in structure of the hair are very unusual; I have, however, once observed the presence of two medullæ. The displacement of the medulla nearer to one side of the periphery of the hair than to the other, in the short and thick hairs of the body, is not uncommon.

50. The middle or fibrous layer of the hair is composed of oval-shaped cells, closely packed together, and arranged in a linear order. These cells are identical in structure with the cells of the deep stratum of the epiderma, that is to say, they are composed of granules congregated around a central granule which constitutes the nucleus of the cell. When examined with the microscope, it is not in all cases easy to discover the cells, but their component granules are always obvious, and from the plan of disposition of the cells, and their oblong shape, the granules have a linear arrangement, and assume the appearance of fibres. The hair-fibres offer some variety of appearance, according to the focus in which they are viewed. For example, with a superficial focus, the peripheral granules are alone seen, and the hair appears to be entirely composed of granules arranged in single rows. With a deeper focus, the rows of granules appear to be associated in pairs, each pair having between them an unconnected row of dark and apparently nuclear granules. In this view the fibres resemble very closely a chain composed of open links. While, with a still deeper focus, the centre of the cell, with its nucleus and granular periphery, is brought into view. In different hairs, these three appearances are seen with various degrees of distinctness.

51. The colour of hair appears to reside partly in the granules and partly in an intergranular pigmentary substance which occupies the interstices of the granules and of the fibres. The most deeply coloured granules are those which constitute the nuclei of the cells, and in the lighter hairs these alone give colour to the fibrous structure. In the darker hairs more or less of the peripheral granules are also

coloured, and pigment may be observed in greater or less abundance in the interfibrous spaces. With respect to the granules, the pigment appears to occupy their periphery, sometimes surrounding them completely, and sometimes occupying a portion only of their surface. In the peripheral granules of the cells, the outer segment is the more frequent seat of the pigment, while many are entirely destitute of that production. This total absence of colour in many of the granules composing even the blackest hair, gives to the fibrous structure, when examined with the microscope, an interruptedly streaked appearance; and the irregular intermixture of pigment granules with colourless granules, bestows upon the tissue between the streaks a dotted character. In red hair, the granules have a delicate golden yellow tint, while the pigmentary matter is amber coloured. In the white hair of Albinoes and of the aged, the pigment is wanting.

52. The external layer of a hair is a thin and transparent envelope, measuring in the hairs of the head about $\frac{1}{8000}$ of an inch in diameter. It is composed of flattened scales, similar to those of the epiderma, and the scales forming the surface of the layer overlap each other from the root to the point of the hair. The overlapping border of the scale is notched and convex, and forms a slight projection beyond the level of the surface. Seen with the microscope, the prominent edges of the scales have the appearance of undulating and jagged lines, which cross at right angles the shaft of the hair. (Plate 4, fig. 1.) The prominence of the edges of the superficial scales of a hair is the cause of the sensation of roughness which we experience in drawing a hair between the fingers from the point towards the root, a sensation which is not perceived when the direction of the hair is reversed. It explains, also, the circumstance of hairs occasionally working their way into wounds, beneath the nails, and into the gums. In the hairs of the axilla the external layer is generally more or less split up into fibres, which give it a shaggy appearance. Sometimes this appearance occurs only on one side of the hair, or more on one side than the other, while at others it is equally conspicuous around the entire shaft. It forms a remarkably distinctive character of the hairs of this region, and is due, as I believe, not to original formation, but to their saturation with the perspiratory fluid.

53. The hairs are implanted at a variable depth within the skin, and are maintained in their position by means of their follicles. The depth of implantation of the hairs of the head is between $\frac{1}{10}$ and $\frac{1}{20}$ of an inch, their roots being situated in the deep stratum of the corium, and frequently extending into the subcutaneous adipose tissue. The hairs of the whiskers, beard, and pubes, are commonly prolonged beyond the corium, while those of the general surface rarely exceed its mid-depth. The depth of implantation of the hair of the pubes is the same as that of the hairs of the head.

54. The follicle of the hair is a tubular canal excavated in the substance of the derma, and lined by a thick layer of epiderma. It consequently presents the same three structures that enter into the composition of the skin, namely, an epidermal lining or sheath, a vascular layer, and the common fibrous tissue of the corium. Of the latter it

is unnecessary to say more than that it offers the same characters around the hair as upon the surface of the derma, and that it sends a delicate sheath downwards upon the root of the hair when the latter extends into the subcutaneous areolar tissue. The vascular layer corresponds with the papillary layer of the derma, and supports a fine net-work of capillary vessels, which supply nutrition to the epidermal sheath and hair. The epidermal layer is composed of strata of superimposed cells, identical in structure with those of the epiderma. It is nearly as thick, and often thicker than the hair which it encloses, and lies in close contact with the latter, and at its lower part it terminates in a slightly expanded and cellular mass, the pulp of the hair.

55. The hair-follicle terminates inferiorly in a slightly dilated cæcal pouch, which is filled for about the extent of $\frac{1}{100}$ of an inch with a mass of minute granules and cells. (Plate 4, fig. 4.) This mass of granules and cells is the pulp of the hair, and the cells are progressively converted into the substance of the hair. The cells produced at the middle of the fundus of the cæcal pouch necessarily proceed upwards in a direct line, and are the first converted into fibres; hence the pointed character of a hair torn up from its root. The cells from the sides of the pouch proceed, with a gentle curve, upwards and inwards, and merge into the substance of the root of the hair, and those from the upper part of the pulp assume an almost vertical position, and constitute, on the one hand, the outer layer of the hair, and on the other, the epiderma of the follicle. So that, at its upper part, the hair-pulp may be said to divide into two parts, a central and isolated part, which constitutes the shaft of the hair, and a tubular sheath, which remains in connexion with the vascular part of the follicle on the one hand, and is in apposition with the surface of the hair on the other. The structure of the pulp and the mode of growth of the hair remind us forcibly of the formation and growth of the teeth, and furnish an additional reason for regarding the latter as dermal appendages. They explain also the well-known fact, that if the epiderma be withdrawn from the derma when loosened by decomposition, the hairs may frequently be removed enclosed in their epidermal sheaths, which obviously extend uninjured around the bulb, and isolate the hair from the vascular part of the skin. I have found the vibrissæ nasi the best fitted for illustrating this point, and I may remark, that the proof of such an organization completely sets at rest the question of the vascularity of the bulb.

Growth of the hair is accomplished by the successive formation of new cells on the dermal surface of its root, in the manner already described as the process of growth of the epiderma. The rapidity of its growth varies greatly under different circumstances, and at different periods of life. In a young person of feeble constitution, recently shaved, I found the hair to have grown four lines in three weeks, showing that the amount of growth is probably more than a line in the course of a week.

56. It is by no means uncommon to find two hairs, and sometimes three, issuing from the aperture of one follicle; but at a short distance below the level of the epiderma, such a follicle would be found to

divide into separate tubules for each hair. Within the nose, I have counted as many as ten hairs issuing in this manner from a common follicle, but below the surface there were always as many tubules as hairs.

57. In a healthy state of the skin, the space between the epidermal lining of the follicle and the hair is very trifling. Indeed, it is merely sufficient to receive the exfoliated scales of the former, which are to be conveyed with the growing hair to the exterior. At a short distance (about half a line) from the epiderma, however, the space enlarges, in consequence of the junction with the follicle of one or two excretory ducts of sebiparous glands (§ 37,) and the consequent stream of sebaceous substance which is poured into it. It is in this part that the entozoa of the hair-follicles are chiefly found.

58. Mandl entertains some peculiar views with regard to the structure and mode of growth of hair. He describes a hair as consisting of a cortical portion, which is cellular, and a medullary portion, which is tubular. Through the latter, he conceives that the fluids of the hair ascend, and are deposited at the free extremity of its shaft, in successive layers, each layer becoming gradually smaller in diameter, until the hair eventually assumes the form of a fine point. This structure, he says, is indicated on the tapering extremity of a hair, by a series of annular lines. The mode of growth here described he believes to be proved by the production of a pointed end upon hairs which have been cut, and also by the whitening of hair which sometimes commences at the point. The latter fact he explains by the transmission of colourless fluids to the end of the hair. Besides this mode of increase, he admits that another takes place at the root, by apposition. I have convinced myself that Mandl is in error with regard to his hypothesis. Growth never takes place at the point of the hair, and consequently, the hair cannot *grow* white at the point. It may exhibit indications of bleaching in that situation from external conditions sooner than in the rest of the shaft, but the process is purely physical. Again, the annular lines to which this author refers are simply the margins of the overlapping scales of the cortical part of the hair, the scales being smaller and less jagged in this situation than on the body of the hair.

59. The hair-follicles are not situated perpendicularly but obliquely in the skin, hence the direction of the hairs, after their escape from the follicles, is in the same sense inclined towards the surface; and the "set" of the hair, from the root to the point, is governed by a law as precise as that which regulates any other of the secondary vital functions. Thus, on the head, the hair radiates from a single point, the crown, to every part of the circumference, making a gentle sweep behind, towards the left, and in front, to the right. The direction of this sweep is naturally indicated on the heads of children, and is that in which the hair is turned. On the forehead, the downy hairs proceed from the middle vertical line, with a gentle curve to the right and left, curving downwards to the situation of the whisker, and forming, by their lower border, the upper half of the eyebrow. Occasionally, the line of divergence of the forehead is oblique in its direction,

running from the left of the forehead to the root of the nose. At the inner angle of each eye is situated another radiating centre, like that of the crown of the head; and a vertical line of divergence is continued downwards from this point, by the side of the nose, mouth, and chin, to the under part of the latter, where it curves inwards to the middle line. The upper and inner rays from this centre ascend to the line between the eyebrows, where they meet those which are proceeding from the opposite centre, and those, also, which are diverging from the vertical central line of the forehead; so that here a lozenge is formed, which is the point of approximation of hairs from four different quarters. It is this circumstance that gives to the hairs of the inner end of the eyebrows a direction towards the middle line; and occasionally we see instances in which, from the unusual development of these hairs, the eyebrows meet at the base of the forehead, and form a little crest, for a short distance, along the root of the nose. The lower and inner rays from the angle of the eye diverge from the preceding, and are directed downwards and inwards upon the side of the nose; when strongly developed, they meet those of the opposite side on the ridge of the nose, and at their point of divergence from the ascending current necessarily form another lozenge. This latter is a lozenge of divergence, that of the forehead being one of convergence. The upper and outer rays from the angle of the eye curve along the upper lid, forming, by their upper margin, the lower half of the eyebrow, and at the outer angle of the eye being lost in the converging currents of the whisker. The lower and outer rays from the centre at the angle of the eye, together with those from the vertical line of the side of the nose, mouth, and chin, make a gentle sweep over the cheek, side of the face, and jaw, to be lost, the upper ones in the front of the whisker, the middle rays, after passing beneath the ear, in the middle line of the back of the neck, and the lowest rays in the angle of bend of the jaw, in which latter situation they come into coalition with an ascending current from the chest. The rays from the inner margin of the vertical line of the side of the nose, mouth, and chin, are directed inwards upon those parts. On the upper lip, they are met by a current directed from the apertures of the nose, outwards, and forming the sweep of the mustachio; a similar disposition is observed in the middle line of the lower lip, near its free edge, while the beard is formed by the convergence of two side currents meeting at the middle line. The current from the side of the head divides at the ear, those which pass in front of that part, and some, also, from the skin before the ear, contributing to form the posterior border of the whisker, and then passing backwards beneath the ear, with the current from the face, to the middle line of the nape; while those which pass down behind the ear converge with those from the back of the head also to the middle line of the nape.

60. On the trunk of the body, there is a centre of radiation from each armpit, and two lines of divergence, one of the latter proceeding from this point horizontally to the middle of the front of the chest, the other from this horizontal line, just in front of the axilla, vertically along the side of the trunk, across the front of the hip, and down the

inner side of the thigh to the bend of the knee. From the axillary centre, and from the upper side of the horizontal line, a broad and curved current sweeps upwards and inwards over the upper part of the front of the chest, and outwards, around the neck to the middle line of the nape, the outermost part of the current passing over the shoulder to the middle line of the back. From the lower side of the horizontal line, and from the front of the upper half of the vertical line of the trunk, the set of the current is downwards and inwards, with a gentle undulation to the middle line, and from the lower half of the vertical line of the trunk, the direction is upwards towards the middle line and umbilicus, so that the latter is the centre of convergence of four streams from the anterior aspect of the abdomen, two from above and two from below. From the centre at the axilla and posterior border of the vertical line of the trunk the current streams downwards and backwards, also with an easy undulation to the middle line of the back. The inner extremity of the horizontal line of the chest is the seat of a lozenge of divergence, and that of the line of the bend of the lower jaw, at the front of the neck, of a second.

61. From the axillary centre just described there proceeds another line of divergence, which encircles the arm like a bracelet, immediately below the shoulder. From the upper margin of this line the direction of the current is upwards over the shoulder, and then backwards to the mid-line of the back. Another line commences at this ring on the front part of the arm, and runs in a pretty straight course to the cleft between the index finger and thumb on the back of the hand: this is the line of divergence of the arm; from it and from the ring the stream sets, at first, with a sweep forwards, and then, with a sweep backwards to the point of the elbow. In the forearm, the diverging currents sweep downwards in front, and upwards behind, also tending to the point of the elbow, which is thus a centre of convergence; while on the back of the hand and fingers the sweep outwards, with a curve having the concavity upwards, is quite obvious.

62. On the lower limb there are two vertical lines of divergence; the one being the continuation of that of the side of the trunk, proceeding around the inner side of the thigh to the bend of the knee; the other, an undulating line, beginning at about the middle of the hip, running down the outer side of the thigh to the bend of the knee, then continuing down the outer side of the leg, reaching the front of the ankle, and terminating on the foot at the cleft between the great and second toe. A short oblique line connects the two vertical lines at the bend of the knee. On the front of the thigh, the streams from the two lines converge, and descend towards the knee. On the back they converge also at the middle line, but ascend towards the trunk of the body. On the leg, where there is but one line, the diverging currents sweep around the limb, and meet upon the shin, while on the foot they diverge with a sweep as upon the back of the hand.

63. Quantity of hair has reference to the proximity of the follicles, and also to the number of follicles which open by one common aperture on the skin. Withof counted the number of hairs on a square inch of skin, and found of black 588; chestnut 648; and flaxen 728.

A similar investigation was made by Jahn in the person of an unusually hairy man, twenty-eight years of age. In a given extent of skin in this person he found on the

Summit of the head	321	hairs.
Back of the head	242	"
Front of the head	238	"
Chin	52	"
Pubes	45	"
Forearm	31	"
Outer border of the hand	20	"
Front of thigh	21	"

In four years after this calculation was made, the man having married in the mean time, the number was diminished on all parts of the body, with the exception of the chin and pubes, where they had increased, on the former seven, and latter five.

64. Looking back on the structure of the hair, we cannot but be forcibly impressed with the perfection of organization which it exhibits, and this feeling increases when we reflect on the elasticity and strength of so delicate and slender a thread. The former of these properties, tested by the experiments of Weber, has been referred to in paragraph 42. A single hair of a boy eight years of age, says Robinson, in his Essays on natural economy, supported a weight of 7812 grains; one of a man aged twenty-two, 14,285 grains; and the hair of a man of fifty-seven, 22,222 grains. Muschenbroeck found that a human hair fifty-seven times thicker than a silkworm's thread would support a weight of 2069 grains, and a horsehair, seven times thicker, 7970 grains. The strength of the hair is due to its fibrous portion, for hairs deficient in this structure, like those of the fallow deer, are remarkable for their brittleness.

65. The development of hair has been made the subject of research by Heusinger and Simon.[1] The latter of these gentlemen observed, that in the embryo of the pig, at an early period, the epiderma is inflected from point to point, so as to form follicles somewhat enlarged at their extremity, which pass obliquely inwards, and enter the tissue of the derma. These follicles are rendered conspicuous from being lined in their interior with cells containing pigment granules, which, in the darker parts of the body, are deep in colour, and lighter in the uncoloured portions. In embryos more advanced in growth, he finds, at the bottom of the follicle, a collection of pigment granules which assume the shape of the root of the future hair. Subsequently to this formation, the pulp makes its appearance. At a later period, the entire hair is produced, and is bent upon itself, so that the point and root are nearly approximated. In this bent condition, the young hair bursts through the aperture of the follicle.

In the human embryo, the lanugo infantium begins to be apparent, during the first half of the fifth month of intra-uterine existence, upon the eyebrows, upper lip, and around the mouth; and at about the middle of the month, upon the head. By the end of the sixth month it is pretty general over the whole body, the last parts on which it is seen being the backs of the toes and fingers, the pinna and the nose.

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[1] Zur Entwickelungsgeschichte der Harre, Von Dr. Gustav. Simon. Muller's Ar., 1841.

At the sixth month Ebel found the hairs of the head to measure three lines, those of the eyebrows two lines, and the eyelashes half a line. At birth, the fœtus is covered with a thick down, and it is then that we have the best opportunity of observing the direction of the hairs (§ 59;) for during the first year, the greater part of these temporary hairs have been shed, and they are succeeded by a more permanent kind, which appear upon the surface only in certain situations. At the period of adolescence the hairs acquire a new impulse of growth in co-relation with the more active development of the frame; and when the powers of the system are on the wane, the hair is among the first of the organs of the body to evince an associated infirmity.

The sebiparous glands appear much later than the hair-follicles, and are developed by a similar process of epidermal inflection from the parietes of the hair-follicles.

66. According to the analysis of Vauquelin, the chemical constituents of hair are, animal matter, in considerable proportion; a greenish black oil; a white, concrete oil, in small quantity; phosphate of lime; carbonate of lime, a trace; oxide of manganese; iron; sulphur and silex. Red hair contains a reddish oil, a large proportion of sulphur, and a small quantity of iron. White hair, again, exhibits a white oil, with phosphate of magnesia. The gray hair of old persons contains a maximum proportion of phosphate of lime.

The ultimate analysis of hair, according to Scherer,[1] exhibits the principal elementary constituents in the following proportions:—

Carbon	50·652
Hydrogen	6·769
Nitrogen	17·936
Oxygen Sulphur	24·643

Fair hair contains the least carbon and hydrogen, and most oxygen and sulphur; black hair follows next; while brown hair gives the largest proportion of carbon, with somewhat less hydrogen than black hair, and the smallest quantity of oxygen and sulphur. The hair of the beard was found to contain more carbon and hydrogen than the hair of the head, and less oxygen and sulphur. The quantity of nitrogen is the same in all.

NAILS.

67. The NAILS are horny appendages of the skin, identical in formation with the epiderma and hair, but peculiar in their mode of growth. A nail is convex on its external surface, concave within, and implanted by means of a root into a fold of the derma (vallecula unguis,) which is nearly two lines in depth, and acts the part of a follicle to the nail. At the bottom of the groove of the follicle are situated a number of filiform papillæ, which produce the margin of the root, and by the successive formation of cells push the nail onwards in its growth. The concave surface of the nail is in contact with the derma, and the latter is covered with papillæ, which perform the double office of retaining the nail in its place, and giving it in-

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[1] Liebig, Organic Chemistry.

creased thickness, by the addition of newly-formed cells to its under surface. It is this constant change occurring on the under surface of the nail, co-operating with the continual reproduction taking place along the margin of the root, which ensures the growth of the nail in the proper direction. For it is clear that if the adhesion of the concave surface of the nail with the derma were not perfectly soft and yielding, the addition of successive layers of cells to the follicular margin would be wanting in the force necessary to push it forward in the direction of its growth.

The nail derives a peculiarity of appearance from the disposition and form of the papillæ upon the ungual surface of the derma. Thus, beneath the root of the nail, and for a short distance onwards towards its middle, the derma is covered with papillæ, which are more minute, and consequently less vascular, than the papillæ somewhat further on. This patch of papillæ is bounded by a semilunar line, of which the concavity is turned towards the root, and in consequence of appearing lighter in colour than the rest of the nail, has been termed the *lunula*. Beyond the lunula, the papillæ are raised into longitudinal plaits, (Plate 2, figs. 4, 5,) which are exceedingly vascular, and give a deeper tint of redness to the nail. These plait-like papillæ of the derma are well calculated by their form to offer an extensive surface, both for the adhesion and formation of the nail. The granules and cells are developed on every part of their surface, both in the grooves between the plaits, and on their sides, and a lamina of nail is formed between each pair of plaits. When the under surface of a nail is examined, these longitudinal laminæ, corresponding with the longitudinal papillæ of the ungual portion of the derma, are distinctly apparent, and if the nail be forcibly detached, the laminæ may be seen in the act of parting from the grooves of the papillæ. This laminated structure upon the internal surface of a nail is seen in a magnified form in many animals; for instance, in the perpendicular wall of the hoof of the horse. Moreover, it is this structure that gives rise to the ribbed appearance of the nail, both in animals and in man. The papillary structure of the derma, which produces the nail, is continuous around the circumference of the attached part of that organ with the derma of the surrounding skin, and the horny structure of the nail is consequently continuous with that of the epiderma.

That nothing may be wanting to complete the analogy between the structure of the nails and that of the epiderma and hairs, pigment granules (§ 27) are found entering into their composition. The grayness of hue which the nails of some persons exhibit is due to the presence of this element, and upon a microscopic examination of a section of the nail, the granules may be observed, in greater or less number, disseminated in streaks among its horizontal strata.

The growth of the nails has been investigated by a French physician, Dr. Beau,[1] who found that the nails of the feet were four times slower in their growth than those of the hands. The latter increased in length one millimetre, that is, two-fifths of a line in one week;

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[1] Archives Générales de Médecine, vol. xi. p. 447.

while the nails of the foot required four weeks for the same amount of increase. According to this observer, the length of the thumb-nail, including the root, which is hidden from sight, is eight lines, that is, twenty millimetres; consequently, the period occupied in the growth of that nail would be twenty weeks, or five months. In like manner, the nail of the great toe, measuring in length nine lines and a half, or twenty-four millimetres, and requiring four times the period of the thumb-nail, would consume ninety-six weeks, that is, nearly two years, in its growth.

Dr. Beau has further remarked that, during the continuance of every constitutional disorder the nails suffer to a greater or less extent. Acording to him, the law of growth of the nails is precisely the same both in health and disease (an assumption which, although not strictly true, approaches sufficiently near the truth to be admitted as a general proposition;) but in the latter state, the materials of growth are supplied by the blood in diminished quantity. Hence, the portion of nail formed during the progress of disease will be perceptibly thinner than that produced during health, and may be distinguished on the surface as a transverse groove. If the disease have been sudden, the outer boundary of the groove will be abrupt, and vice versâ. And if the disease be one in which the nutritive functions are seriously affected, the depth of the groove will maintain an exact correspondence. Admitting these data, Dr. Beau suggests, as a practical application of his observations, the possibility of determining the period of occurrence and also the period of duration of a disease, provided the time do not exceed that required for the entire growth of the nail. For example: a groove, or rather ledge, situated at the distance of eight millimetres from the edge of the root of the thumb-nail, or five from the free margin of the skin, is indicative of an attack of disease which commenced eight weeks previously; while the breadth of the groove being two millimetres would prove the disease to have continued for the space of two weeks. After five months the thumb-nail ceases to be a tell-tale, on account of its entire growth in length being accomplished, and the vestige of disease consequently obliterated. The great toe-nail, however, may now be appealed to. At five months, the groove indicative of the above disease has advanced only five millimetres from the root, and is only just becoming apparent beyond the free margin of the skin, the breadth of the groove being only half a millimetre. In making these observations, M. Beau selects the thumb-nail and corresponding nail in the foot, because in them only he finds the appearancés regularly present.

To put Dr. Beau's observations to the test of experiment, I noted an illness which took place in myself, commencing on the 14th of December, and lasting for a fortnight. On the 1st of May following, I found, across each thumb-nail, a groove measuring one line in breadth. Now, a line is equal to two-and-a-half millimetres, and as the rate of growth, according to Dr. Beau, is one millimetre a week, my illness should have lasted two weeks and a half instead of two weeks. I therefore came to the conclusion that, either my own feelings of convalescence preceded the perfect restoration of the functions of nail-formation, or that the rate of growth of the nail was more rapid in me than in other persons. I next measured the distance between the distal margin of the groove and the epidermal margin at the root of the nail, and adding to that quantity three millimetres for the depth of nail concealed by the follicle, obtained as a result seventeen millimetres; in other words, a space representing seventeen weeks, whereas the real time was nineteen weeks and a half. This was exactly the reverse of my first observation, and went to prove that, in me, at least, the growth of the nail was less rapid than is represented by Dr. Beau. Nevertheless, the experiment came sufficiently near the truth to render Dr. Beau's observations interesting and deserving of attention.

68. In a chemical analysis of the horny tissue of nail, Scherer[1] found the elementary constituents in the following proportions:—

Carbon	51·089
Hydrogen	6.824
Nitrogen	16·901
Oxygen	25·186
Sulphur	

PHYSIOLOGY OF THE SKIN.

69. In a physiological point of view, the skin is an organ of sensation, absorption, and secretion; in the former capacity it affords us gratification, and warns us of the presence of injurious or destructive agents; by means of the second, it is enabled to appropriate the fluids contained in the surrounding medium, and perform the office of a respiratory organ; and by means of the third, it provides for its own softness and pliancy, it regulates the influence of temperature, both external and internal, and acts as an important depurating organ of the blood.

70. The sensibility of the skin varies normally in different parts of the body; thus it is greatest on the pulps of the fingers, and least in the middle of the limbs, as of the thigh and arm.

This has been proved by the curious results of the researches of Weber, who applied the points of a pair of compasses to the skin, in various parts of the body, in order to ascertain the degree of sensibility of the skin in the perception of a double impression.

Thus, upon the pulp of the middle finger, the two points were felt when only separated from each other to the extent of one-third of a line; on the palmar surface of the same finger it was necessary to separate them two lines; on the cheek, five lines; forehead, ten lines; on the middle of the breast, twenty lines; and on the middle of the arm and thigh, thirty lines. He observed, moreover, that the delicacy of perception was greatest in the direction of the branches of the nerves, as, transversely on the face and front of the neck, longitudinally on the fingers, &c.[2] The same author has pointed out some remarkable instances of differences in the perception of temperature; thus he has shown that if the two hands be immersed in water of the same temperature, that in which the left is placed will feel the warmest: and again, that a weak impression made upon a large surface of skin, produces a more powerful effect upon the nervous system than a strong impression upon a small surface. This is practically illustrated by taking hot water and immersing the finger of one hand, and the entire of the other hand; the single finger will suffer no inconvenience from the heat, while to the hand it may be insupportable. In pursuing the investigation of the diseases of the skin, we find hourly instances in proof of these facts.

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[1] Liebig, Organic Chemistry.

[2] I have repeated these experiments, and the results are truly surprising.

The sensibility of the skin is subject to considerable modification under the influence of disease; the natural sensibility may be heightened, or it may be diminished, or again, it may be altered. These changes obviously depend on some modification of the nervous system, the nature of which is, for the present at least, beyond our grasp. The more common morbid sensations of the skin, in addition to heat and cold, are itching, tingling, smarting, pricking, shooting, creeping, tickling, burning, scalding, &c.

71. By means of its absorbing power, the skin is enabled to act as a respiratory organ. The importance of this function in man is not sufficiently estimated, but in the lower animals it is universally acknowledged. The process of absorption in the skin is effected by an active endosmosis, which is more and more controlled by vital influence, as it reaches the strata of the epiderma most nearly in contact with the derma. This function of the skin is calculated to enact an important part in the health of the individual, in relation to the purity or impurity of the atmosphere in which he moves.

72. When the body is immersed in water of a certain temperature, say at 82° of Fahrenheit,[1] and a few degrees below, and allowed to remain in it for some time, it increases in weight by absorption of the fluid. The fact is proved by the experiments of several physiologists. Westrumb[2] detected the ferrocyanate of potash in the urine of a man who had taken a bath which contained that salt in solution; and D'Arcet found the urine of another alkaline, who had bathed in the Vichy waters. Other experimentalists have succeeded in discovering colouring matters, such as rhubarb, in the urinary secretion after bathing in water containing such substances. Opposite results to these —namely, loss of weight by transpiration—take place whenever the temperature of the bath nearly approaches or exceeds that of the body. These experiments have another important bearing on the physiology of the skin, since they prove that the temperature of a bath which conduces to absorption has the effect of a sedative on the system, and diminishes the rapidity of the pulse, while the converse, acting as an excitant of exhalation, increases the frequency of the heart's pulsations.

73. The absorbent property of the skin is sometimes taken advantage of for the purpose of introducing nutritive matters into the system, and at others for the exhibition of medicinal substances. Some of the latter produce their characteristic effects when simply applied to the surface by means of a bath or poultice; but more frequently we

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[1] Berthold, in Muller's Archiv. for 1838.

[2] Journal Hebdomadaire, No. 7.

find it necessary to resort to the additional aid of friction, and moreover, we select those parts of the skin in which the epiderma is thinnest. The substances to be absorbed must be presented to the skin in the state of solution or suspension in water or oil; but it must be admitted that the quantity taken into the system is very small. The exhibition of medicinal substances by friction on the skin, termed the *Iatraleptic method*, is only adapted for the more powerful medicines, and is rarely employed at the present day, excepting in the instances of mercury, croton oil, strychnine, &c. The epiderma acts as an impediment to absorption, and as such, as an important safeguard against the admission of injurious and poisonous substances into the system. Thus we find that it is only after long soaking, or by long-continued friction, that we are enabled to overcome this natural defence, and then only to a very partial extent. But when the epiderma is removed, the case is altogether altered. The derma is a highly absorbent tissue, and medicinal substances and poisons, when brought in contact with it, frequently act with as much rapidity and energy as when introduced into the stomach. On this account, the *endermic method*, as it is called, offers some advantages when medicines disagree with the alimentary canal, or are repelled with loathing by the patient. In the adoption of this method of administering medicinal agents it is necessary to raise a blister in the most expeditious and least painful manner, unless there be an open wound already present, and then sprinkle the substance, in a state of fine powder, over the surface. It follows, therefore, that such medicines can alone be administered in this manner as produce their effects in very small doses, such as strychnine, morphine, digitalis, belladonna, lead, mercury, &c. The absorbent power of the skin is sometimes painfully evinced in the inflammation of the kidneys which follows the application of a blister, in the constitutional effects resulting from the absorption of lead, or in those which succeed the use of arsenic to ulcerated surfaces.

74. An observation made by Mr. Creely[1] would seem to explain the accidental absorption of poisonous substances by the skin, without abrasion of the epiderma, and to prove that the confinement of its exhalation is an important auxiliary. Thus, he remarks, "I have often succeeded in procuring vaccine vesicles without puncture, on the skins of children especially, and young persons, by keeping lymph in contact with the skin, and excluding it from the air by a coating of blood. Active lymph blended with blood casually trickling down the arm, and drying in the most dependent part, will often give rise to a vesicle." In this case it is obvious that the lymph will become gradually dissolved in the perspiratory secretion, an important consideration in respect to the prolonged contact of poisonous substances with the skin.

75. The softness and pliancy of the skin are, in great measure, dependent on the secretion of the sebaceous substance which is poured out on every part of its surface. This secretion is most abundant in situations where, from the influence of physical action, the skin would

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[1] Observations on the Variola Vaccina, in the Transactions of the Provincial Medical and Surgical Association, vol. viii.

be liable to injury were it deprived of a similar covering. Thus we find it in large quantities on the head and face, upon the trunk of the body, in the armpits, and in the perineum. The sebaceous secretion is an oleaginous fluid, containing water, stearine, oil globules, pigment granules, and salts, together with epidermal cells thrown off by the parietes of the glands and ducts. The secretion is modified in its qualities in different parts of the body; in some, by the presence of an odorant principle, and in others, by a peculiarity in taste or colour. Of the former, is the butyric acid of the perineal region, and the latter, the yellowish brown and bitter product of the sebiparous glands of the meatus auditorius, the ceruminous glands. In chemical composition, sebaceous substance consists, according to Esenbeck,[1] of

Fat	24·2
Osmazome, with traces of oil	12·6
Watery extractive, (salivary matter)	11·6
Albumen and casein	24·2
Carbonate of lime	2·1
Phosphate of lime	20·0
Carbonate of magnesia	1·6
Acetate and muriate of soda, and loss	3·7
	100·0

"The ear-wax is an emulsive compound which contains a soft fat, albumen, a peculiar extractive bitter matter, epithelium scales, lactate of lime, and an alkaline lactate, but no chlorides and no phosphates soluble in water."[2]

76. The function of the skin as a regulator of the temperature of the body, and as a purifier of the blood, is effected by means of a peculiar secretion, the perspiration. When this secretion is eliminated in the form of an imperceptible vapour, it is termed *insensible*, and when condensed or poured out in a fluid state, *sensible* perspiration. The insensible perspiration is partly derived from the sudoriparous and sebiparous glands, and partly from the natural evaporation taking place from the epiderma. The sebiparous system has not been heretofore pointed out as a source of the perspiratory fluid, but frequent observation has convinced me that this apparatus plays an important part in the elimination from the system of the watery elements of the blood. Lavoisier and Seguin estimate the mean quantity of perspiration, both insensible and sensible, secreted by the skin in the course of twenty-four hours, at thirty-three ounces, while they assign to the pulmonary exhalation twenty-one ounces. The experiments of Dr. Dalton furnished him with different results, since he attributes to the lungs an amount of exhalation five times greater than that of the skin.

77. The quantity of perspiration is altered by a variety of circumstances which affect the body physically, or through the agency of the nervous system. Of the former kind are the temperature, current, and hygrometric condition of the atmosphere, and stimulation of the skin; and of the latter, excited or depressed nervous powers. When

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[1] Gerber's General Anatomy, edited by Gulliver.

[2] Simon, Animal Chemistry, translated by Dr. Day, Am. Ed.

the temperature of the atmosphere is unusually elevated and the air dry, perspiration takes place with so much activity, as to preserve the heat of the body at its natural standard. If, instead of being still, the atmosphere pass over the surface in a current, the quantity of perspiration is still farther increased, and the cooling influence is more felt. But if, with the same temperature, the atmosphere be loaded with moisture, perspiration is prevented, and the heat of the body becomes intense. The influence of stimulation in the promotion of perspiration is shown in the effects of exercise, the warm bath, diaphoretics, &c. Instances of the influence of the nervous system are exhibited in the total arrest of perspiration during the hot stage of fever, and of its great increase under emotions of a depressing kind, as fear and anxiety, and also in syncope. The perspiratory secretion possesses its highest amount of activity during digestion, while immediately after taking food it is at its minimum.

78. The secretion of perspiration is also modified by the greater or less activity of the other secretions, particularly of the lungs and kidneys, the function of these organs being frequently vicarious with the skin, and vice versâ. Thus, during the summer, and in warm climates, the perspiratory secretion is augmented, while the exhalation from the lungs and the quantity of urine are diminished. In the winter and in cold climates the reverse is the case. On quitting a warm apartment, especially after indulging in stimulants, for the cold air, a sudden check is given to the cutaneous function, while that of the kidneys is suddenly and actively called into exercise. The same fact is observed in certain diseases; thus, the excessive sweats of phthisis may be regarded as vicarious of the diminished exhalation from the lungs, while diabetes is accompanied by a remarkably dry state of the skin. The arrest of perspiration again, from cutaneous disease, is often attended with serious congestions of the mucous membranes.

Of some experiments made by Dr. Lining in South Carolina, on the relative quantities of perspiration and urine during the warmer and colder months of the year, the results are as follow:[1]

	Perspiration.	Urine.
July	86·41	43·77
May	58·11	56·15
October	40·78	46·67
February	37·45	77.86

79. The influence of the perspiration in regulating the heat of the body is strikingly evinced in the numerous recorded instances of exposure of the person to elevated temperatures. Sir Charles Blagden supported a temperature of 260° for nearly ten minutes. The furnace in which Sir Francis Chantrey dried his moulds, and which was frequently entered by his workmen, is said to have been kept heated to a temperature of 350°; and the oven used by Chabert during his exhibitions in London, was heated to between 400° and 600°. On the first exposure of the body to these high temperatures the individual is distressed by the heat; but as soon as the perspiration flows freely, all inconvenience ceases. The thermometer placed in the mouth of a

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[1] Dr. Robley Dunglison on Human Health.

man who had been exposed to a temperature of 120° for a quarter of an hour, stood at 105°; and the temperature of animals when the heat has been raised to a degree sufficient to cause death, has never exceeded in elevation from nine to fourteen degrees above the natural standard.[1]

80. In a damp atmosphere the cooling influence of the perspiration is necessarily lost, and the effects upon the system of a prolonged exposure to a moist atmosphere at a high temperature, have been recorded by a gentleman who recently visited the baths of Nero, near Pozzuoli, the ancient Posidianæ. To reach the bath, he had to pass along a narrow winding passage, of about 120 yards in length, and seven feet high, by about three in breadth. A little within the mouth of the passage, the temperature was 104° in the upper strata of the atmosphere and 91° near the ground; farther on, the air was filled with dense vapour, of a temperature of 118° above, and 111° below; and over the bath it was 122°, the heat of the spring being 185°. After proceeding for about one-third the length of the passage, he began to feel a sense of oppression and discomfort, his pulse rising from 70 to 90 beats in the minute. A short distance farther, the oppression increased, his breathing became rapid and panting, and he was under the necessity of stooping his head frequently to the earth, in order to obtain a chestful of air of a less suffocating temperature. His skin, at this time, was bathed in a profuse perspiration, his head throbbing, and his pulse beating 120 in the minute. Continuing his progress, the sensations of suffocation became insupportable; his head felt as though it would burst; his pulse was so rapid as to defy calculation; he was exhausted and nearly unconscious; and it required all his remaining power to enable him to hurry back to the open air. On reaching the mouth of the passage, he staggered, and nearly fainted, and was very uncomfortable until relieved by a bleeding from the nose. During the rest of the day, his pulse remained at 100; he had uneasy sensations over the surface of the body, and did not recover until after a night's repose. The same gentleman bore a temperature of 176° in dry air without inconvenience.[2]

81. The recent experiments of M. Fourcault[3] throw considerable light on the importance to health of the secreting functions of the skin. The results of the observations made by this gentleman go to show, that if the cutaneous transpiration of an animal be wholly prevented by means of an impermeable covering, the animal will die in a short space of time, apparently in a state of asphyxia. Becquerel

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[1] It is interesting to note, that in animals made the subjects of these experiments, the blood was found in the opposite position to that which it would have occupied after death from cold. Instead of being collected about the heart and internal organs, as in death ensuing from the latter cause, the heart was empty, and the vital fluid dispersed towards the periphery of the body, in some instances being actually forced out of its vessels into the surrounding tissues. The blood seemed to have been killed by the heat, for it had lost its power of coagulating, and its deep black hue was not altered by exposure to the atmosphere, a change which takes place in living blood. In a moist atmosphere, the animals died sooner than in dry air of a higher temperature, and without losing weight; in dry air they lost weight.

[2] Gazette Médicale, April 27, 1844.

[3] Examinateur Médicale, Oct. 1841.

and Breschet, pursuing their experiments on animal temperature, conceived that if they could prevent transpiration by the skin, they should induce internal fever; the contrary, however, was the fact. After the application of a thick layer of varnish upon the skin of a rabbit, and adjusting their thermo-electric needles, they found the temperature of the deep muscles, in the course of half-an-hour, reduced from 100° to 89°; in another half-hour, to 76°; and in a third half-hour, it stood at only three degrees above the temperature of the atmosphere, 63°; so that, in the course of an hour and a half, the temperature of the animal had fallen thirty-four degrees, and the creature died.

82. The chemical constituents of perspiration are water, nitrogen, animal extract, fat: carbonic acid with its salts, carbonates of soda and lime; lactic acid with its compound, lactate of ammonia; acetic acid, butyric acid, chloride of sodium, hydrochlorate of ammonia, phosphates of soda and lime, sulphate of soda, salts of potash, and peroxide of iron. Anselmino gives the following analysis[1] of the dried residue of the perspiratory secretion:—

Matters insoluble in water and alcohol, chiefly calcareous salts . .	2
Animal matter soluble in water, insoluble in alcohol, regarded by Anselmino as salivary matter, (?) and sulphates	21
Matters soluble in dilute alcohol; chloride of sodium and osmazome .	48
Matter soluble in alcohol, osmazome, and lactates	29
	100

Simon collected the perspiratory fluid from the arms and face, and found it to be a turbid, dirty-looking fluid, which deposited gray floccules on standing. By the microscope these floccules were ascertained to be epidermal cells. The specific gravity of the fluid was, in one instance, 1,003, and in another, 1,004. It was slightly acid at first, but became neutral on standing for twenty-four hours, and a rod moistened with hydrochloric acid held over it at this period detected the vapour of ammonia. The results of the investigations of Simon establish the existence in the normal perspiratory secretion of—

"Substances soluble in ether: traces of fat, sometimes including butyric acid.

"Substances soluble in alcohol: alcoholic extract, free lactic or acetic acid, chloride of sodium, lactates and acetates of potash and soda, lactate or hydrochlorate of ammonia.

"Substances soluble in water: water extract, phosphate of lime, and occasionally an alkaline sulphate.

"Substances insoluble in water: desquamated epithelium and (after the removal of the free lactic acid by alcohol) phosphate of lime, with a little peroxide of iron."[2]

Dr. Landerer found urea in healthy perspiration in addition to phosphates, sulphates, acetates, lactates, chloride of sodium and osmazome.[3]

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[1] Muller's Physiology, Translation, page 579.

[2] Animal Chemistry with reference to the Physiology and Pathology of Man. By Dr. J. Franz Simon. Translated and edited by Dr. George E. Day, for the Sydenham Society, Am. Ed.

[3] Heller's Archiv. vol. iv., p. 196.

Our information, with regard to morbid perspiration, is very limited and unsatisfactory. Simon made the analysis of this secretion obtained from a man who had been the subject of psoriasis vulgaris for seventeen years; but his results are inconclusive, from the fluid being in a state of decomposition. Its specific gravity was 1,008; it smelt strongly of hydro-sulphate of ammonia; and gave off when evaporated a penetrating odour of sulphuretted hydrogen, which ultimately merged into a nauseous animal smell. "It yielded 9·9 of solid constituents, which, after being exposed to the influence of a red heat, were found to consist of a large proportion of chloride of sodium, carbonate of soda, a little phosphate of lime, and a fair amount of sulphuric acid." The perspiration of "persons with the itch is said to have a mouldy odour." And "according to Stark, the quantity of free lactic acid is increased" in certain cutaneous affections.

83. The gases of the perspiratory secretion—namely, carbonic acid and nitrogen—are exhaled in largest quantity after meals or violent exertion, the former being most abundant where the food has been vegetable, and the latter where the food has been animal.[1] The quantity of water excreted by the skin bears reference to the circumstances above detailed—namely, the comparative activity of the exhaling organs, the condition of the atmosphere, and the state of the system. The nitrogen, according to Liebig, originates chiefly in the decomposition of the atmospheric air carried into the stomach with the saliva, or absorbed from the exterior by means of the skin. During digestion, the oxygen of the atmospheric air enters into combination with the food, and the nitrogen is set free to make its way by endosmosis through the stomach and diaphragm into the lungs, or through the parietes of the body to the skin. It follows, therefore, that the quantity of nitrogen set free in the stomach, and, consequently, the quantity exhaled by the skin, is proportioned to the duration of digestion. Thus, in certain herbivorous animals in whom the process of digestion occupies a long period, and is increased by rumination, a large quantity of atmospheric air is conveyed into the stomach, and a larger proportion of nitrogen is extricated from the skin, than in carnivora. The same circumstance must take place when any cause exists which retards digestion. The quantity of carbon also bears reference to the nature of the ingesta; where a large quantity of carbonic acid is generated in the stomach, the gas makes its way directly to the lungs, as did the nitrogen, or to the skin. Dr. Dalton estimates the proportion of carbon eliminated by the skin, irrespective of variety in food, at one-twentieth of the entire quantity of perspiratory secretion. To the animal matters, the ammonia, the acetic acid, and the lactic acid, are to be ascribed the powerful odour of the perspiratory fluid, while its acid reaction is determined by the latter.

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[1] Collard de Martigny, in Majendie's Journal, vol. x., p. 162.

CHAPTER II.

CONGESTIVE INFLAMMATION OF THE DERMA.

84. UNDER the general title of congestive inflammation of the derma, I have assembled a group of diseases, which are characterized, as a leading feature, by inflammation, and consequent redness of the skin. This group, with some exceptions, corresponds with the Exanthemata of Willan, and embraces all the diseases included by him under that order, with the omission of purpura. Reviewing the prominent features of this group of diseases, it will be perceived that they admit of a natural division into two sub-groups—namely, into such as are characterized by

Inflammation of the derma and mucous membranes, with constitutional symptoms of a specific kind,

under which head I have ranged

Rubeola,
Scarlatina,
Variola,
Varicella,
Vaccinia;

and,

Inflammation of the derma without constitutional symptoms of a specific kind,

which embraces

Erysipelas,
Urticaria,
Roseola,
Erythema.

85. The diseases contained in the first of these groups are the exanthematous or eruptive fevers of medical practice. They are characterized by fever of greater or less severity, which precedes and accompanies the exanthem; by an exanthem, or inflammatory congestion of the derma, which makes its appearance in the form of red points, and pursues a specific course; and by their mode of termination—namely, in resolution and desquamation of the epiderma in the first two, and by exudation and incrustation in the variolous affections; while all are liable to terminate by delitescence.

86. Taking this view of the exanthematous diseases, I conceive myself warranted in placing the variolous affections in a group with which all their analogies harmonize. They correspond accurately with the definition I have given above; the premonitory symptoms present a close resemblance to those of rubeola and scarlatina; the

eruption is identical at its first appearance; and the general management required is the same. At a later period, when variola assumes the pustular form, it must be regarded, as far as pathology is concerned, in the light of an advanced stage of rubeola and scarlatina, or as a severe type of the latter diseases expending its violence on the skin, instead of retrograding on the mucous membranes. Certainly, if we admit, with hesitation, the variolous diseases to a place among the exanthematous fevers, we are bound to rescue them from the unpathological position which they at present occupy among the Pustulæ and Vesiculæ of Willan's classification.

87. The severity of the febrile symptoms of exanthematous diseases is determined primarily by the nature and activity of the exciting cause of the disease, by the state of constitution of the person affected, and by the greater or less freedom of evolution of the morbific action upon the tegumentary textures. Secondarily, it is modified by the extent and severity of the exanthem, or, in other words, by the reaction of the effects upon the system. The constitutional symptoms are also much modified by the extent of surface diseased. When that surface is great, as is necessarily the case where not merely the dermal layer, but the whole mucous membrane of the body is affected, the peripheral and sentient parts of a considerable proportion of the nerves of the body are involved in the inflammatory disorder, and, as a consequence, the spinal and cerebral symptoms reach their highest pitch of severity and danger.

88. The congestion of the superficial capillary vessels which accompanies the exanthemata is not limited to the dermal tissue alone, but is distributed more or less completely over the tegumentary surface of the entire body, including the mucous membranes. From the great suceptibility of the latter, they are generally the first affected, as we perceive to be the case in the angina of scarlatina, and the catarrh and conjunctivitis of rubeola. In like manner, erysipelas, urticaria, roseola, and erythema, have all their mucous inflammations, though presenting a sub-acute and less conspicuous type. This difference, however, is always apparent between the inflammation of the cutaneous surface and that of the mucous membrane. In the former, the inflammation either invades the entire surface at once, or runs regularly and more or less rapidly over it; but in the mucous membranes, the different parts are affected irregularly and in succession, while some escape altogether. Thus, in scarlatina, the mucous membrane of the fauces is first invaded, then possibly that of the lungs, while, perhaps, at the close of the disease, when a favourable convalescence is expected, the inflammation may be transferred to the alimentary canal, or kidneys, and prove fatal by exciting an uncontrollable diarrhœa or anasarca. The same remarks apply equally to rubeola; for after the violence of the cutaneous efflorescence has passed away, there is yet much to be apprehended from secondary inflammations of the mucous membranes.

89. The immediate seat of the inflammatory congestion of the exanthemata is in the vascular rete of the derma, and the difference of tint observable in these diseases at their height and during their de-

cline is sufficiently explained by reference to the structure and normal phenomena of the skin. When the degree of excitation of the cutaneous nerves is small, and the arterial determination but little exalted above the ordinary standard, the vascular rete of the derma is only partially congested, and the redness produced by this congestion is slight; such is the redness, with slight modifications, depending on degrees of intensity of nervous excitement, which is seen in erysipelas, roseola, and erythema. When, however, the nervous activity is aroused to its highest pitch of energy, as in scarlatina, the congestion is most intense, and the bright scarlet of the arterial blood coursing through its vessels is little obscured by the thin veil of epiderma which binds it in its sphere. The congestion in rubeola, scarlatina, and variola, is not confined to the horizontal strata of the vascular rete of the derma, but implicates also the vertical rete of the follicles, and in that manner gives rise to the punctiform and papillar appearance of the redness which is characteristic of these eruptions.

90. The crescentic, or rather, the imperfectly circular, form of the congested patches seen in rubeola, depends upon a peculiarity in the distribution of the cutaneous nerves and vessels, and corresponds with that natural appearance of the skin which is so frequently seen in healthy children, and which is denominated mottled. Again, I have observed, that in injecting the limb of an infant with size and vermilion, I can imitate all the forms of redness seen in the exanthematous diseases, by ceasing to inject from time to time, or by filling the capillaries to their uttermost.

91. The decline of congestion of the derma is accompanied by certain alterations in the tint of redness which betokens its presence. Thus the red patches are observed to lose their vivid brightness, to become duller in their hue, and to pass through various shades of purple, until they become bluish and livid. These changes depend upon the degree of excitement of the cutaneous nerves at the several periods indicated by alteration in the colour of the exanthem. When the nervous energy is at its highest point, the capillaries contract actively upon their contents, and maintain a rapid current of arterial blood through their channels. But as the nervous excitement becomes gradually allayed, the capillaries lose their power to contract, and become distended by the full stream that moves more and more tardily onwards in its course, giving time to the arterial current to combine with the carbon of the tissues through which it flows, and becomes converted into venous blood.

92. The above phenomena will explain, also, the differences of colour which the exanthem may assume at an earlier period than its decline, and even from the commencement of its appearance, as, for instance, in scarlatina maligna, or more strikingly, in rubeola nigra. The first step or motive influence by which this change is effected, is depression of nervous power; this depression, depriving the capillaries of their tonicity, or, in other words, of their means of resisting the pressure of the arterial current, they yield, they become dilated, and from capillaries, which they were, they are converted into a venous plexus, through which the blood moves feebly and slowly, gathering carbon in its tardy course.

93. Congestion of the capillary rete of the derma necessarily gives rise to tumefaction, the extent of swelling being, to a certain degree, the measure of the increased quantity of blood distributed through the part. Hence it is obvious that all exanthematous patches must be raised above the level of the surrounding skin, even although the degree of tumefaction be really very slight.

94. Another cause of tumefaction in an inflamed and congested tissue, also follows as a natural consequence from the over-distention of its vessels. I have already endeavoured to show that the nervous excitation of the part must have diminished before over-distention of the capillary vessels can take place, but so soon as that change has ensued, another phenomenon is immediately developed. This is transudation of the watery part of the blood by imbibition into the surrounding textures, thereby physically relieving the congested vessels of their overload of fluid. The fluid which is thus transuded through the coats of the vessels is serum, containing in solution more or less of fibrine. The seat of this imbibition is for the most part the subcutaneous areolar tissue, where it gives rise to œdema. I may instance scarlatina in some cases, erysipelas œdematosum, and erythema læve, as particular illustrations of this kind of tumefaction, although it will be found, upon close observation, to be much more extensively present among the exanthemata. This important phenomenon is not confined to the dermal tissue, it occurs also in the mucous membrane, and sometimes with fatal consequences, as, for instance, in the laryngitis of scarlatina rubeola, where it is apt to induce œdema of the glottis.

95. Besides the œdema resulting from serous infiltration into the subdermal tissues, it may happen that the transudation occurs also in the tissue of the derma itself, in which case the skin presents a red, bloated, and brawn-like appearance, as in some forms of erysipelas. Or again, not confined to the sub-dermal and dermal tissues, the serous fluid may, after the repletion of those textures, be effused upon the surface of the derma, and raise the epiderma in the form of vesicles and bullæ, as we frequently see to be the case in common erysipelas. This character associates erysipelas with the third natural group of diseases of the skin—namely, with inflammation of the derma, combined with serous effusion upon its surface, including the orders Bullæ and Vesiculæ of Willan.

96. As the whole of the diseases included in the first of the preceding groups are infectious and contagious, it may be well to inquire the précise meaning which we attach to these terms. In their more usual acceptation, the terms infection and contagion relate to modes of transmission of a poisonous principle. When the transmission is effected by a material substance, and is brought about by actual contact, the term *contagion* (immediate contagion) is employed; but when transmission is effected through the agency of the winds, and at a distance, the mode of communication is designated *infection* (mediate contagion.) In other words, when the poisonous principle is volatile, and capable of diffusion in the atmosphere, it is infectious; but when this diffusibility is absent, it is sim-

ply contagious. The difference between infection and contagion is consequently more apparent than real, and some of our most able writers use one or other of the terms to imply transmission without reference to its mode. Thus, it is observed by Dr. Watson, "Since in all cases the disease is conveyed to the person of the recipient by particles of matter proceeding from the person of the sick, and since it seems very unimportant whether those particles are in a solid or in a gaseous form, whether they are imparted by direct contact of the two human bodies, or by being wafted through the air, or carried upon articles of clothing, I shall include both and all these modes of communication under the simple term, contagion. This, in fact, is what is done in common discourse: all disorders that are catching, I shall take leave to consider contagious."[1]

97. In whatever way the poisonous principle be brought to the body of a sound person, and with whatever part of his body it come in contact, whether with the cutaneous surface with or without abrasion, as in contagion, or with both the cutaneous and mucous surface in infection, the mode of its reception by the system is the same. In the first instance, it is dissolved in the fluids of the body, and, in the second place, is conveyed by imbibition into the circulating current of the blood, thence to act on the nervous system, and alter its functions. Once introduced into the system, the poisonous principle possesses the remarkable power of exciting an action similar to that which existed in the body whence it emanated, the intention of that action being the reproduction of an identical poison. Liebig has compared this process to fermentation; as, when a particle of yeast is brought in contact with a fermentable fluid, the particle of yeast is itself lost, or is too insignificant to be traced further; but the action which it excites occasions the formation of an abundance of similar yeast.

98. In certain diseases regarded as contagious, another mode of transmission occurs; the principle of contagion exists in the form of germs or seeds of a parasitical organism, which, wafted to a soil fitted for their nutrition, become developed, and assume an active growth. Of this kind are the parasitic fungi found upon the surface of the bodies of animals, and, according to some, the mycoderma of the crusts of favus. Langenbeck found fungi in the body of a man who died of typhus fever. Mr. Owen has seen them coating the internal surface of vomicæ in the lungs of the flamingo; and similar observations have been made by other observers.

99. The most interesting, as it is the most important of the phenomena of morbid poisons, is the modification which they produce in the system of the affected person. By virtue of this modification, the susceptibility to be excited by a similar stimulus, or to take on a similar action, is deteriorated, and, in many instances, entirely abolished. We might recur again to the simile suggested by Liebig, for we are incapable of again exciting fermentation in a fluid that has already fermented. It is upon this important principle that safety from a repetition of attacks of eruptive fever reposes.

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[1] Lectures on the Principles and Practice of Physic. American Edition.

I. INFLAMMATION OF THE DERMA AND MUCOUS MEMBRANES, WITH CONSTITUTIONAL SYMPTOMS OF A SPECIFIC KIND.

RUBEOLA.

Syn. *Morbilli;* Ali-abbas. *Blactiæ;* Ingrassias. *Rubeolæ;* Sauvages. *Rosalia, Phænicismus. Measles.—Rougeole,* Fran.—*Die Masern, Kindspecken,* Germ.

100. Rubeola, or measles, is an acute inflammation of the tegumentary investment of the entire body, both cutaneous and mucous, associated with fever of an infectious and contagious kind.

Upon the skin, it is characterized by a patchy redness, which, on close examination, is found to be produced by numberless minute red points and pimples, aggregated into small patches of a crescentic and annular form. The efflorescence makes its appearance on the fourth day from the commencement of the febrile symptoms, increases for another four days, and is succeeded at its decline by furfuraceous desquamation of the epiderma.

Rubeola usually attacks children and young persons, but may occur at any period of life; infants and adults, however, are but little susceptible of its influence. Its effects have been observed in the fœtus at birth, (Hildanus,) where the mother has suffered from the disease during pregnancy. The period of incubation of the contagion varies from seven to fourteen days, and the same individual may be affected more than once. Its punctated and papillated appearance depends upon the state of congestion of the vascular rete of the follicles, and the semilunar form of the patches, upon some unexplained peculiarity in the structure of the derma, probably having reference to the distribution of the cutaneous nerves. The mottled aspect of the skin of children in health, and exposed to the cold, has the same semilunar tracery, and an analogous state may be produced artificially by incomplete injection with size and vermilion.

101. The varieties of rubeola are four in number—namely:

Rubeola vulgaris.
" sine catarrho.
" sine exanthemate.
" nigra.

RUBEOLA VULGARIS.

Morbilli benigni; erethrici.

102. In rubeola vulgaris, the ordinary form of measles, the disease sets in with the usual symptoms of fever—namely, with chills, succeeded by burning heat, listlessness, languor, drowsiness, pains in the head, in the back, and in the limbs; frequent pulse; soreness of the throat, white tongue, with red edges and tip; thirst, anorexia, nausea, vomiting, frequent dry cough, and high-coloured urine. These symptoms increase in violence during the first four days. On the third, the conjunctivæ look red and inflamed, there is intolerance of light,

and the eyelids are congested and swollen, while a profuse secretion of lachrymal fluid distils from the eyes, constituting *coryza*. The mucous membrane of the nose also pours forth a large quantity of watery secretion, and the irritation of this membrane gives rise to frequent sneezing. Inflammation of the mucous membrane of the larynx, trachea, and bronchial tubes, is indicated by hoarseness, impeded respiration, constriction and pain in the chest, and violent cough. Moreover, children are affected occasionally with spasm of the muscular system and convulsions, the consequence of reflex action of the spinal nerves; these spasmodic attacks are especially frequent where rubeola is complicated by dentition.

The cutaneous efflorescence of rubeola makes its appearance on the fourth day, and is attended with heat and itching; in children with a delicate skin it appears occasionally on the third; and, in some instances, from exposure to cold, or deficient susceptibility in the skin, on the fifth or sixth. It is first perceived on the forehead and front of the neck, next upon the cheeks, and around the nose and mouth; and if the interior of the latter cavity be inspected, it may be seen, with similar characters to those exhibited on the surface of the body, upon the mucous membrane of the fauces and pharynx. By the fifth day, the efflorescence on the face reaches its height; it then appears upon the trunk of the body and upper extremities, and on the succeeding day upon the lower extremities. On the sixth day, the rash upon the body and limbs reaches its height. The backs of the hands are the parts last affected, the rash appearing on them not before the sixth day, and sometimes as late as the seventh.

The efflorescence of rubeola, when closely examined, is seen to consist of innumerable punctiform dots and minute pimples, aggregated into small circular patches, which, by their increase or coalescence, assume an irregularly crescentic form. The patches are slightly raised above the surface, and the entire skin is somewhat swollen. The colour of the rash at its acme, is a bright raspberry red; on the eighth day, it presents a yellowish red tint, and then gradually fades to the normal standard of the skin. The pimples are most frequently found mingled with the efflorescence on the exposed parts of the body, as upon the face and hands, and this is particularly the case in infants and adults. Occasionally miliary vesicles are observed to complicate the rash, and in a case recorded by Willan, inoculation with the lymph of these vesicles was found to produce a perfect attack of rubeola, which was communicated by infection to several other children.

The decline of the efflorescence takes place in the same order as its invasion, fading on the sixth day, upon the face; on the seventh day, upon the trunk and limbs; and on the eighth day, upon the backs of the hands. On the ninth day, the form of the patches is discoverable only by the presence of a pale yellowish discoloration, which slowly disappears. To these changes a furfuraceous desquamation succeeds, which is attended with considerable itching.

Of the constitutional symptoms, some are relieved on the outbreak of the efflorescence, while others are aggravated. Thus the nausea and sickness subside on the fourth day, the restlessness and sense of oppression disappear on the sixth day, while the coryza, the catarrh the hoarseness, and the cough, with the frequency of the pulse, decline on the seventh day. At about the ninth or tenth day, the resolution of the congestion of the intestinal mucous membrane is indicated by diarrhœa of some days' continuance. In the Archives Générales de Médecine, is mentioned the case of a child who became dumb in consequence of retrocession of measles. The power of speech, however, returned at the end of two years. The recital of this case is accompanied by another, in which a dumb child was restored to speech by a severe rubeola.

It has been already remarked, that the mucous membrane of the eyes and of the pharynx is visibly affected with the rash. Other symptoms which occasionally develop themselves during the progress of rubeola, indicate a state of congestion of the internal mucous membrane. Thus, in some cases, there is hemorrhage from the nose; in others, from the air-passages; and in females, not unfrequently from the uterus. Whenever the rash is checked in its course by cold or other causes, the constitutional symptoms are aggravated and dangerous, the congestion of the mucous membranes is greatly heightened, the tongue becomes brown and dry, and the patient delirious.

103. Although rubeola, when it runs its course regularly, is by no means a dangerous disease, yet, at its close, it is occasionally attended by severe and alarming sequelæ, which call for the most vigilant attention on the part of the medical practitioner. Thus the cough, after the subsidence of the rash, may return with increased force and frequency, and be accompanied by a quickened pulse, impeded respiration, and symptoms of hectic fever, and lead to a fatal issue, by effusion into the lungs and chest, or by the development of scrofulous tubercles. Children are sometimes seized with difficulty of breathing from swelling of the mucous membrane of the air-passages and larynx, and die, unless relieved by tracheotomy, in the course of a few hours. The conjunctivitis, which was symptomatic of the disease during its progress, may continue in a chronic form and give rise to ulceration of the eyelids. The inflammation of the pituitary membrane of the nose may merge into the chronic form, and pour out a purulent secretion. The mucous membrane of the mouth and fauces in infants may develop aphthæ and troublesome ulcerations; and in children of riper years, tumefaction of the lips and ulceration of the angles of the mouth. The salivary glands may become enlarged by the propagation of the inflammation along their excretory ducts. In some instances, abscesses resulting in fistulous ulcers have been formed in these glands. The diarrhœa, which usually ceases spontaneously after the lapse of a few days from the disappearance of the efflorescence, may continue uncontrollable for several weeks, and issue fatally from ulceration of the mucous membrane. The mucous membrane of the vulva may participate in the inflammation, become ulcerated, even slough, and give rise to occlusion of the aperture, as occurred recently in a little girl operated on by Mr. Ferguson.[1] The lymphatic system may sympathize in the effects of the cutaneous irritation, and occasion enlargement of the glands, which sometimes form abscesses and ulcers, or

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[1] Lancet, vol. ii., 1850, p. 578.

where the mesenteric glands are affected, the little patient may be destroyed by interference with the current of the chyle. In other instances, secondary affections of the skin are developed, in the form of vesicles, pustules, and furuncles. When these cutaneous eruptions appear during the violence of the mucous irritation, the visceral disease is considerably relieved, and the recovery favourable.

Measles are most prevalent, and the accompanying catarrh most severe during the winter, and particularly during the first three months of the year. On the other hand, in the summer season, and during the warm weather, the disease, when it occurs, is mild and subdued.

"In measles, which are considered by Schönlein as the most highly developed form of catarrhal disease occurring in the northern hemisphere, the urine changes with the varying stages of the disorder. In most cases it more or less resembles the inflammatory type; it is red (as in inflammatory measles,) acid and sometimes jumentous (turbid) as in gastric measles, or deposits a mucous sediment during the course of the morning (as in catarrhal measles.) Becquerel states, as the result of his observations, that the urine is generally inflammatory at the commencement of the febrile period. It becomes very dark, and of high specific gravity, and frequently deposits a sediment of uric acid: a small quantity of albumen was found in a few of the cases. During the eruptive period, the character of the urine changes; if the eruption is slight and there is not much fever, it resumes the normal type; if the contrary is the case, the urine retains the inflammatory appearance. Becquerel did not meet with any case in which the urine was turbid or sedimentary towards the close of the eruptive stage.

"During the period of desquamation and of convalescence, the urine either returns at once to the normal state, or contiues turbid and sedimentary for some time, or becomes pale, clear, and anæmic. In three cases, anasarca came on during convalescence, but the urine did not contain albumen."[1]

RUBEOLA SINE CATARRHO.

104. This form of measles is perfectly identical with rubeola vulgaris, with the exception of the catarrhal and febrile symptoms, which are either exceedingly slight or wholly absent. The efflorescence is precisely similar, and follows the same stages. Rubeola sine catarrho is usually observed during the prevalence of an epidemic of measles, when some children will be found to be attacked by the simpler variety, while the greater number are seized with the disease in its ordinary form. It is not unfrequently met with in one member of a family, when the rest of the children have the more severe disease; and this is especially the case where a number of children are congregated together, as in a public school. Rubeola without catarrh is sometimes the immediate precursor of rubeola vulgaris, and children affected by this form are more liable to a second attack of measles than those who have experienced an attack of the ordinary kind.

RUBEOLA SINE EXANTHEMATE.

105. As measles may occur, divested of their mucous inflammation, constituting the previous variety, so, in more rare instances, the febrile

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[1] Simon's Chemistry, Am. ed.

symptoms and mucous inflammation may be developed, with only a partial efflorescence, or, according to some authors, with no cutaneous affection whatever. Rubeola sine exanthemate, when it exists, is observed under the same circumstances with those in which the previous variety appears—namely, as isolated cases, occurring during the progress of an epidemic, among the members of a family affected with measles, or in a large assemblage of children. Sydenham refers to this form of disease under the name of febris morbillosa, and Dr. Gregory contributes additional testimony to its existence. "Guersent," says Rayer,[1] "has observed some individuals in families where measles prevailed, exhibiting all the other symptoms of the disease, except the eruption. I have myself several times seen cases of measles in which the eruption was incomplete, and which might have been referred to the morbillary fever of Sydenham; but I have never met with any instances like those mentioned by De Haen, Gregory, and M. Guersent, although my attention has been turned to these some years past."

RUBEOLA NIGRA.

Rubeola maligna.

106. In a debilitated state of the system, the cutaneous capillaries become over-distended, and the circulation through them retarded, while some portion of their contents is effused into the surrounding tissues. This condition of the vessels gives to the efflorescence a purplish and livid appearance, with which a tint of yellow is intermingled, and, in certain situations, a variable number of small spots bearing a close resemblance to petechiæ. This form of measles is rare, and has been described by Willan, under the designation of rubeola nigra. It commences with all the characters of rubeola vulgaris, and runs the usual course until about the seventh or eighth day. At this period the pulse becomes quickened, there is great lassitude, with prostration of the vital powers, and the appearance of the rash alters to the purplish and livid hue above noted. Sometimes the constitutional symptoms put on a more severe character, the respiration is quick and impeded, the cough troublesome; the digestive organs much disturbed, with parched mouth and nausea; probably delirium and effusion into the serous cavities, with œdema of the areolar tissue. With these aggravated symptoms, the disease is likely to terminate fatally. Rayer remarks that he has "seen various examples of these livid measles in children labouring under tubercles of the lungs and chronic cæco-colitis, and who were exhausted by diarrhœa and hectic fever."

107. Rayer has also remarked a variety of "black or hemorrhagic" measles, which are unconnected with constitutional debility, and characterized by a vinous-coloured efflorescence not disappearing under pressure with the finger. He met with this form in strong individuals, and he finds a transition to such a modification in the greater depth of colour, and non-disappearance under pressure of the patches in an ordinary case of rubeola vulgaris.

108. *Diagnosis.*—The diagnostic characters of rubeola are, firstly, the

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[1] Treatise on the Diseases of the Skin, translated by Dr. Willis, p. 145.

affection of the mucous membrane, as indicated by redness of conjunctivæ, coryza, catarrh, sneezing, sore throat, and cough, by which the disease may be distinguished even before the appearance of efflorescence; and, secondly, by the crescentic patches of the rash, with intermediate unaffected portions of skin.

From scarlatina it is distinguished by the crescentic patches; the crimson or raspberry-like hue of the redness, and the presence of coryza, catarrh, and sneezing.

In roseola, the common form, although the rash is so similar as to have obtained for it the name of *false measles*, the accompanying fever and inflammation are so extremely slight as to remove the possibility of mistake.

The minute spots by which the efflorescence of rubeola first makes its appearance are like those of variola, especially on the face and forehead, where they are slightly papular; but upon the trunk and limbs this difference is generally apparent between them—namely, that in measles the red points are mere spots, while, in variola, they are distinctly elevated papulæ.

109. The cough of rubeola is at first dry and harsh; at a later period expectoration ensues, the expectorated mucus presenting some peculiarities which are deserving of notice. Rayer describes these appearances as follows:—"At first mucilaginous, clear, and limpid; at the end of three or four days the expectoration becomes thick, rounded into pellets, smooth on the surface, of a greenish-yellow colour, remaining perfectly distinct from each other, and swimming in a large quantity of ropy and transparent mucus, similar to the matter coughed up by some phthisical patients. By-and-bye this form of expectoration is changed for another which adheres to the bottom of the vessel, and seems composed of a grayish homogeneous mucus, mixed with air and saliva, and very similar to the ordinary matter expectorated during chronic catarrhal affections. In young people the expectoration is wanting, or not at all abundant; and many cases of measles occur in older subjects without being attended with expectoration." Chomel remarks the following difference between the nummular expectoration of rubeola and phthisis—namely, that in the former, the nummuli swim in a transparent fluid, and in the latter, in one which is opaque.

The diagnosis of the varieties of rubeola needs no especial mention.

110. *Causes.*—Rubeola would seem to have originated in Arabia, the birthplace of variola and scarlatina, and to have extended with them to Europe and the rest of the world. It was first described by Rhazes. The most remarkable epidemics of measles which have occurred in this country, are those of London in 1671, 1674, 1763, and 1768, having Sydenham for their historian; and the epidemic of Plymouth in 1741, recorded by Huxham.

Measles are the consequence of a special infection or contagion; under the influence of which, conjoined with a favourable state of the system, rubeola is developed. In many cases the disease is sporadic or epidemic in its eruption, in others it is communicated by contagion. The experiments of numerous authors have shown that the exanthem may be transmitted by inoculating a sound person, either with the blood, with the fluid of the accidental vesicles which sometimes complicate the rash, or with the secretions of those affected with the disease. [In the year 1842, Von Katona, during an epidemic of measles in Hungary, inoculated 1112 individuals with the blood, the fluid of the vesicles, and the tears, and succeeded in all but 78 cases. According to Panum the eruption always appears on the 13th or 14th day after the reception of the contagion into the organism. Simon, p. 126.]

Measles may occur at any period of life, but are most frequent in children. The disease is more universally contagious than any of the exanthematous fevers, but is only partially protective of the constitution; for instances are by no means rare, in which the same individual has been affected more than once. The most obvious condition influencing the attack of rubeola, is inflammation of any of the mucous membranes, such as catarrh, cough, &c. This, indeed, constitutes a morbillous constitution, and the disease is most prevalent at the period when such a constitution is most likely to exist—namely, during the early months of the year. Successive epidemics of measles are usually characterized by some peculiarity either in the intensity of the disease, or variety in the affection of especial organs.

Patients affected with measles must be secluded from those who are sound, in order to protect the latter against contagion. The period for the maintenance of seclusion is not rightly determined, but for the sake of security should be prolonged to at least three weeks.

111. *Prognosis.*—Rubeola may generally be regarded as a mild disease, particularly when it runs its course regularly, when the symptoms of inflammation of the mucous membranes are not severe, and the season temperate. The circumstances which are calculated to render it serious are, irregularity in its course; its occurrence during dentition, pregnancy, after parturition, or in persons suffering for some time previously from chronic disorder of an internal organ, particularly the lungs; retrocession of the cutaneous eruption; acute affection of the viscera, as of the lungs, the alimentary canal, &c., or severe secondary disorder. Rubeola nigra is dangerous only when complicated with excessive debility, or with any of the unfavourable conditions above specified.

112. *Treatment.*—When the disease is mild and regular in its course, milk diet, subacid diluents, a moderate and equable temperature of the sick chamber, quiet, and rest, with some simple mucilaginous drink to ease the cough, will be all the treatment required. Indeed, the less the patient be interfered with by the employment of medicines, the better.

If the febrile symptoms run high, saline aperients and diaphoretics, such as the liquor ammoniæ acetatis with spiritus ætheris nitrici, ipecacuanha, and camphor mixture, may be employed; but active purgatives are calculated to be injurious, either by determining a retrocession of the eruption, or by exciting a diarrhœa not easily to be checked. Moreover, it must be borne in mind, that diarrhœa occurring at about the ninth or tenth day is a natural consequence of the resolution of the fever. When from any cause the occurrence of the diarrhœa is protracted beyond its proper period, it may be admonished by a gentle purgative. An emetic at the commencement of the attack is approved by many practitioners, and is often useful.

When the cough is violent, the respiration frequent and difficult, with pains in the chest denoting inflammation of the lungs, abstraction of blood must be resorted to. In children, weakly adults, or old persons, leeches to the chest, or cupping in this region will be sufficient. In persons of stronger habit, general bleeding from the arm will be found necessary. In the country, many patients will bear venesection with advantage, while in crowded towns or cities this remedy must be employed with circumspection. As an auxiliary to bleeding, or as a representative when the system may be too weakly for its use, counter-irritation by blisters or stimulant liniments will be found beneficial, and both remedies will be assisted by ipecacuanha or tartarized antimony. Opiates are available only after the violence of the febrile symptoms has subsided, and then they may be advantageously combined with a diaphoretic, as in Dover's powder.

Cold affusion has been recommended in measles, but has not gained friends, on account of the susceptibility to congestion of the mucous membrane of the respiratory apparatus. When, however, the skin is hot and dry, and so long as it continues so, sponging with cold water, or with vinegar and water, may be adopted with safety and comfort to the patient.

Should the efflorescence recede suddenly, and some internal organ become affected, blood must be withdrawn from the region of such organ, and the rash recalled by means of a mustard-bath, and the application of a blister.

Rubeola nigra requires no other treatment, in addition to that above recommended, unless especial indications present themselves, in which case the latter must be managed according to the common principles of therapeutics; thus, for debility, tonics, mineral acids, &c., must be administered.

113. The sequelæ of rubeola call for a treatment especially directed to the nature of the secondary affection. For the cough and pulmonary affection, counter irritants externally; with diaphoretic salines and ipecacuanha internally are best suited. Where speedy dissolution is threatened from swelling and œdema of the mucous membrane of the trachea and larynx, and where the local abstraction of blood by leeches has failed to afford relief, tracheotomy must be performed. Chronic conjunctivitis and ulceration of the eyelids are best treated by the application of blisters behind the ears, or upon the nape of the neck, with a weak solution of nitrate of silver, or a collyrium of sulphate of zinc to the parts affected; anointing the borders of the lids at bed-time with simple cerate, to prevent their adhesion during the night. The same plan of management is adapted to the removal of unpleasant secretions from the ears, with the addition, in chronic cases, of an injection of chloride of lime. Aphthous vesications and ulceration of the mouth and fauces require astringent and acid gargles, or brushing by means of a sponge, with a weak solution of nitrate of

silver. In children too young to employ these remedies, a linctus containing the sub-borate of soda may be found sufficient. Ulceration around the mouth will speedily yield to nitrate of silver, or a solution of chloride of lime. When the salivary glands are enlarged, and threaten to suppurate, this termination may generally be prevented by the application of a small blister over the tumefied organ, or by blistering the surface with the nitrate of silver. The diarrhœa may be permitted to continue, unless it be prolonged for too long a time, and occasion debility and constitutional irritation. When such an event is anticipated, the best treatment will be found to be, the application of a blister on the abdomen; frictions on the legs, with a stimulating liniment; mercury with chalk, or rhubarb and magnesia, internally, in the first instance, succeeded by chalk mixture, and the usual means for checking diarrhœa. When the lymphatic glandular system is affected, the liniment of croton oil, rubbed on the integument covering the enlarged glands, will be found of great service. Indeed, any treatment for the relief of the sequelæ of measles will be inefficient, unless it be accompanied by counter-irritation. It is upon this principle that the secondary eruptive affections of the skin are found to conduce so materially to the cure of the internal disorder. These eruptive affections are therefore not to be repelled, without establishing in the first instance a more manageable form of counter-irritation, such as an open blister, &c., in which case the eruptions will gradually disappear.

During convalescence the patient should be protected from pulmonary affections by warm apparel, and avoidance of a cold and damp atmosphere.

SCARLATINA.

Syn. *Febris scarlatina. Morbilli confluentes. Rubeola rossalia. Scarlet Fever.*—*Scarlatine*, Fran.—*Scharlachfieber*, *Scharlachaufschlag*, Germ.

114. Scarlatina is an acute inflammation of the tegumentary investment of the entire body, both cutaneous and mucous, associated with fever of an infectious and contagious kind. It commences with fever, which invades at an indefinite period between the second and the tenth day[1] after exposure to infection or contagion. On the second day of the fever, the eruption is developed in the form of minute points and papulæ, which constitute patches of large size, or a general efflorescence of a vivid scarlet colour. The rash terminates at the end of six or seven days, leaving the skin rough and harsh, and the epiderma peeling off in furfuræ and thin laminæ.

115. The varieties of scarlatina, which are merely modifications in degree of one typical affection, are four in number—namely,

Scarlatina simplex.
" anginosa.
" maligna.
" sine exanthemate.

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[1] An exceptional case is reported by Dr. Duncome of the Bahamas, wherein the poison remained latent for eleven weeks.

SCARLATINA SIMPLEX.

Scarlatina benigna; Erethrica. Scarlatina sine anginâ.[1]

116. Scarlatina simplex, the most benign form of scarlet fever, commences with a feeling of languor and lassitude, with pains in the head, in the back, and in the limbs; with drowsiness, nausea, and rigors, these being succeeded by heat, thirst, and the usual symptoms of pyrexia, and increasing towards the evening. Upon the breaking out of the efflorescence, the pulse is quick, but feeble; the patient is anxious, depressed in spirits, agitated, restless and sometimes delirious. The eyes are red and humid, but without lachrymation; the face is swollen; the tongue, covered in the middle with white mucus, is studded with congested papillæ of a vivid red colour, and red along the edges; the tonsils are enlarged, and the palate and pharynx red. There is a frequent dry cough, a troublesome tingling and itching sensation of the skin, and swelling of the hands and feet. Sometimes, however, it happens that the eruption of scarlatina occurs without pain or febrile symptoms.

On the second day from the commencement of these symptoms, the efflorescence appears upon the face, neck, and breast, in the form of minute points, which become aggregated into patches of irregular form and size. By the third day, the rash has extended to the trunk of the body and upper extremities, and to the mucous membrane of the eyes, the nose, the mouth, the pharynx, and air-passages, and by the fourth day to the lower extremities. The patch-like distribution of the eruption is its normal character upon the trunk of the body. On the face, the neck, and upon the limbs, it speedily becomes continuous and diffused. The skin is hot and itching, and fully distended by the congestion of its vessels. The scarlet surface is sometimes uniform and smooth, (*scarlatina planâ vel levigata,*) at other times, and in some situations, it is dotted with elevated points of a deeper tint than the adjoining surface, and is rough and granular to the touch, (*scarlatina papulosa vel milliformis,*) and occasionally, though rarely, it is accompanied by the development of serous vesicles, (*scarlatina vesicularis, vel phlyctænosa, vel pustulosa.*) The efflorescence attains its most vivid redness upon the evening of the third or fourth day after its commencement. It is always brighter in the evening than in the morning, and in certain parts of the body, as upon the loins, the nates, and flexures of the joints, than upon the rest of the surface.

The decline of scarlatina commences on the fifth day from the eruption; the redness diminishes on those parts first where it first appeared; islets of skin of its natural hue begin to be apparent in the midst of the redness, and epidermal desquamation occurs upon the face and neck. On the sixth day, the efflorescence has still further decreased, and on the seventh has nearly disappeared. On the eighth and ninth days, the desquamation of the epiderma has become general, and, in many parts, laminæ of considerable size are thrown off. The resolution of scarlatina is sometimes accompanied by a sudden and temporary renewal of the rash, preceded by a febrile paroxysm.

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[1] *Dr.* Robert Williams.

"In all the acute exanthemata the urine very frequently presents, as Schönlein remarks, a peculiar character which is due, in many cases, to an admixture of the bile-pigment: it has a dark brown colour, and resembles badly fermented beer in appearance. At the commencement of the crisis the urine becomes clearer, and forms a pulverulent sediment consisting of uric acid (and, perhaps, urate of ammonia.)

"In scarlatina, the urine, at the commencement, while there is considerable fever, is of a deep dark red colour, and possesses all the properties of inflammatory urine.

"In children the urine is always less coloured than in adults, and its colour in this disease is proportionately less dark.

"It almost always has an acid reaction, and only exhibits a tendency to become rapidly ammoniacal, when the disease is associated with a nervous or septic condition of the system. Any sediments that may be formed consist, for the most part, of urate of ammonia and uric acid mixed with a greater or less quantity of mucus: blood-corpuscles are occasionally noticed. When the urine is ammoniacal, viscid whitish sediments of the earthy phosphates are deposited, and if there is much gastric disturbance the urine becomes jumentous (turbid.) Albumen is commonly but not always found in the urine during the period of desquamation. Dropsy may even supervene without the urine becoming albuminous; it is sometimes preceded by the occurrence of hæmaturia."[1]

Simon further observes in reference to the contradictory opinions put forth with regard to the presence of albumen in the urine: "We have dropsical symptoms with albuminuria, dropsical symptoms without albuminuria, and albuminuria without dropsical symptoms. Solon found albumen in the urine in twenty-two out of twenty-three cases of scarlatina. On the other hand, Philipp[2] observed, in Berlin, where scarlatina was recently very prevalent and anasarca could not be warded off, at least sixty cases in which the urine was tested both with heat and nitric acid, and no trace of albumen could be detected. Dr. Simon remarked that a desquamation of the mucous membrane was ascertained by the presence of numerous epithelial cells in the sediment, a condition which frequently preceded the desquamation of the epiderma.

SCARLATINA ANGINOSA.

Scarlatina mitior.[3] *Angina Scarlatinosa.*

117. Scarlatina anginosa is a modification of simple scarlatina, and is especially characterized by severity of the inflammation of the mucous membrane of the fauces and pharynx, and by swelling and ulceration of the soft palate and tonsils.

The primary symptoms of this variety of scarlatina are identical with those of the simpler form of the disease, but more violent. The fauces from the commencement, and often before the invasion of the symptoms, are redder than natural. There is a rapidly increasing sense of constriction about the throat, and a stiffness of the muscles of the neck, and of the jaw. Upon the second day of the febrile symptoms, the throat feels rough, the voice is hoarse, there is a large collection of viscous mucus in the fauces, and deglutition is painful and difficult. On the third and fourth days, the redness of the fauces has increased, the mucous membrane looks turgid and swollen, and is studded with patches of false membrane and superficial ulcerations. The uvula and tonsils are so much enlarged as nearly to block up the isthmus faucium, and the tongue is coated with white mucus, and appears set with red gems, from the congestion and elongation of its papillæ. While the local affection is thus rapidly progressing, the constitutional symptoms are indicative of serious and dangerous disturbance. There is nausea with vomiting, quickened respiration, a quick and feeble pulse, great languor and restlessness, head-ache, delirium, and excessive heat of skin, 104° or 105°. Heberden observed the temperature of the surface, as indicated by the thermometer, to be 112 degrees of Fahrenheit.

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[1] Simon, Animal Chemistry. Am. Ed.

[2] Casper's Wochenschrift, 1840, No. 35.

[3] Dr. Robert Williams.

When ulceration of the mucous membrane of the fauces occurs, the inflamed surface is seen to be studded on the second or third day with a number of white patches, around which the congested vessels form a zone of deep red. From the fifth to the tenth day the whitish patch or false membrane is thrown off, and leaves a small superficial ulcer, which quickly heals. Ulceration takes place chiefly in irritable constitutions, and at certain seasons of the year, as, for instance, during the autumnal and winter months.

The cutaneous eruption in scarlatina anginosa is retarded by the severity of the affection of the mucous membrane, and of the constitutional symptoms. It fails to appear until the third day, and is then only partial in its efflorescence. Upon the trunk of the body it forms scattered patches of variable size, while upon the limbs it is developed chiefly around the joints. It endures longer than the eruption of scarlatina simplex, and the desquamation which ensues upon its decline is less regular and extensive. Occasionally the rash disappears suddenly the day after its eruption, to return in a day or two. This occurrence takes place more frequently in the autumn and winter season than during the rest of the year, and is either fatal in its consequences, or an aggravation of the constitutional severity of the disease.

The decline of the eruption takes place on the fifth or sixth day, and at the same time the severity of the inflammation of the fauces subsides, the sloughs are thrown off, and the ulcerations begin to heal. The latter process, however, and the disappearance of the congestion of the mucous membrane, are not accomplished before the fifteenth or twentieth day. When the throat and fauces only begin to be affected at the height of the rash, or even at its decline, the dispersion of the inflammation is postponed till a later period. The constitutional symptoms follow in the train of the affection of the throat.

SCARLATINA MALIGNA.

Scarlatina gravior;[1] *torpida; nervosa; putrida; septica.*

118. Scarlatina maligna is a highly aggravated form of scarlatina anginosa, occurring in persons of debilitated constitution, principally in the winter months of the year, and in damp, unhealthy, and ill-ventilated situations. Sometimes it makes its attack sporadically, while at other times it invades suddenly and unexpectedly during the progress of scarlatina simplex or anginosa.

The chief characteristics of scarlatina maligna are, the extreme prostration of the powers of the system, the absence of swelling of the tonsils, and the extensive and deep sloughing ulceration of the fauces. The pulse, in this affection, is irregular, and scarcely perceptible; there is great restlessness, deafness, delirium, and coma. The eyes look red and sunken, there is an acrid secretion from the nose, which produces soreness and excoriation around the nostrils. The cheeks are swollen and aphthous. The lips, the teeth, and the tongue, are covered by a dark brown or black fur. The tongue is swollen and tender, or even ulcerated, and the tonsils are deeply ulcerated, and covered with dark-coloured sloughs. Respiration is impeded, quick, and rattling; there is a quantity of viscous phlegm in the pharynx; the breath is fetid; deglutition painful and difficult; there is stiffness of the muscles of the jaws, diarrhœa, and sometimes hæmaturia.

The eruption in this form of scarlatina is late in appearance; it is pale and indistinct, with the exception of a few patches of irregular size, which speedily become dark and livid, and mingled with petechiæ. "Their whole skin," writes Dr. Sims,[2] "instead of the scarlet, assumed a very remarkable appearance, which resembled nothing so much as that of a dead body which has been kept several days, or as if a mixture of blood and water were universally diffused under it, and could be seen through it." The duration of the rash is equally uncertain with its period of invasion. "In some instances, the rash suddenly disappears a few hours after it is formed, and comes out again after the expiration of a week, continuing two or three days; in one case, numerous patches of it appeared a third time, on the seventh day from the second eruption, then remained for two days."

Scarlatina maligna is an extremely fatal disease, as may be inferred from the severity of its symptoms. Some patients are cut off at an early period—namely, on the second, third, or fourth day, while others withstand its violence for a longer period. Those who perish early, exhibit appearances of extensive ulceration in the fauces, larynx, trachea, lungs, or in the œsophagus and alimentary canal, after death. The great fatality of this disease may be inferred from the observation of Willan, that "in 1786–7, more than two-thirds of those who were affected with the scarlatina maligna died between the seventh and nineteenth day of the fever."

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[1] Dr. Robert Williams.

[2] Memoirs of the Medical Society of London.

SCARLATINA SINE EXANTHEMATE.

Scarlatina sine eruptione.[1]

119. During the progress of an epidemic of scarlatina, some few cases have been occasionally observed, in which the fever and angina were present, but without any, or with a scarcely perceptible efflorescence. Such an instance once fell under my own notice, in a weakly child, who slept in the same apartment with three of his brothers and sisters, suffering from the ordinary attack of scarlatina simplex. This form of the disease is more frequent in a secondary attack, before the health has become completely re-established, than as a sporadic variety, and is more likely to occur in the adult than in children.

ACCIDENTAL MODIFICATIONS OF SCARLATINA.

120. When so extensive a surface of the body is affected as that which is the subject of disease in scarlatina, it is natural to expect that many modifications may arise from circumstances apparently trivial, such as those which are referrible to age, constitution, season, &c. Thus while, on the one hand, cases may occur in which all the constitutional symptoms are present without the efflorescence, on the other hand, the very reverse of this may happen. Dr. Sims remarks, "in one child the scarlet fever appeared without any angina, and having finished its course, left the patient seemingly in perfect health; but in a few days the fever returned without any eruption, but with a very considerable degree of sore throat, and much pain and swelling of the tonsils and parotids, which likewise ran its course, as if the former symptoms had never appeared." The same author observes, that during the periods of the year which are unfavourable for scarlatina—namely, in autumn, and winter, "a frequent, short, hacking cough took place in several patients," without expectoration: that this symptom was most severe where the cutaneous eruption and affection of the throat were the slightest. "Another circumstance in the months of November and December was, that a few days after the apparent change of the disorder, a swelling attacked the face, but more frequently the extremities, attended with the most excruciating pain." "Some first complained of a violent tooth-ache; after two or three days they complained of an equally violent pain in the back, the first one gradually subsiding. In a day or two more, or even sooner, the pain attacked their elbows, wrists, and hands, which were usually the parts last attacked."

Dr. Watson[2] and Dr. Corrigan[3] have pointed out an occasional variety of scarlatina anginosa, in which there is great and rapid swelling under the angles of the jaw, without a corresponding inflammation of the fauces. The patient suffers much from pressure upon the cervical vessels and nerves, and the cellular tissue frequently passes into the state of sloughing. At the outset of the swelling, Dr. Corrigan found a few leeches of service; but he warns us against their use if the inflammation be fairly established, and he especially indicates the danger of incisions.

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[1] Dr. Robert Williams.

[2] Lectures on the Practice of Physic. American Edition.

[3] Clinical Lectures.

SEQUELÆ OF SCARLATINA.

121. The development of the exanthema, upon certain parts of the body, is always accompanied by more or less œdema of the subcutaneous areolar tissue. In the majority of cases this œdema is removed by absorption of the serous effusion at the decline of the eruption, but occasionally it terminates in ulceration or mortification. "Two instances of this tendency to mortification occurred in two children lately admitted into St. Thomas's Hospital. In one, the whole of the toes of the right foot had sloughed off, and the integuments of the leg had mortified from the knee to the foot. In the other, mortification of the upper lip had commenced, and continued to spread till nearly one half of the face was eaten away. The former patient recovered, the latter died. This tendency to mortification is common to many parts of the body. Dr. Watson, in his account of the fever that prevailed in the London Foundling Hospital, gives one case that died of mortification of the rectum, and also six others that died sphacelated in various parts of the body. In the girls, some had the pudendal region mortified; two had ulcers of the mouth and cheek, which sphacelated externally; while one had the gums and jaw-bone so corroded, that most of the teeth fell out before she died. The lips and mouth of many also that recovered, were ulcerated, and continued so for a long time."[1]

In other cases, at the close of scarlatina, and during convalescence—namely, during the period intervening between the tenth and twentieth day, and sometimes as early as the fifth or sixth day, anasarca is developed. This sequela, which is referrible to the transfer of inflammatory action to the structure of the kidneys, is indicated by languor, head-ache, restlessness, and symptoms of general constitutional disturbance; to these succeed œdema of the face and lower extremities, and, in a short space of time, of the entire body. Subsequently, effusions, frequently containing urea, take place into the serous cavities, and the case becomes serious. The urine is deficient in quantity, of that peculiar smoky colour which indicates the presence of albumen, and is frequently coloured by the presence of blood, the consequence of impeded circulation in the kidney, and rupture of the capillaries of the Malpighian bodies, or turbid, and deposits a whitish sediment. Anasarca is usually regarded as a consequence of exposure to cold and damp, during the progress of scarlatina, or at too early a period after convalescence; but it may also result from any cause capable of arresting or diverting the natural course of the disorder, in other words, of preventing the elimination of the animal poison, which is the essence of the disease. Hence an imperfect or checked eruption is the common precursor of anasarca, or it may occur after the subsidence of the cutaneous efflorescence, when an undue amount of poison still remains in the blood, and an excess of duty is forced upon the kidneys, the latter organs being already weakened by congestion, imperfect circulation, and accumulation of epithelium, and, possibly, of fibrinous cylinders in their tubular structure.

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[1] Elements of Medicine. By Robert Williams, M. D. Vol. i., page 127.

Anasarca sometimes proceeds from another cause than inflammation and congestion of the structure of the kidneys—namely, from anæmia. This happens in children naturally weakly and pallid, and is less serious than the inflammatory form. It may occur as early as the fourth day of the eruption, or at any later period; the features in this case are contracted and pallid, the tongue and lips bleached, and the skin pale; there is little or no fever; the urine is pale, often neutral from the presence of phosphatic salts, and contains neither albumen, blood corpuscles, nor epithelial cells. The cause of the dropsy in this instance appears to be defect of fibrine in the blood, and want of power to excrete the urea. The œdema begins in the vicinity of the joints.

Besides the preceding, inflammation and effusion of serum and pus may take place into the joints. The mucous membranes also suffer; the inflammation of the conjunctiva sometimes becomes chronic, and lasts for a considerable time. Inflammation of the mucous lining of the tympanum and Eustachian tube may terminate in deafness, and that of the meatus auditorius in chronic suppuration. Occasionally, ulcerations are formed around the nose or mouth; thickening of the upper lip may also occur; aphthæ of the tongue and mouth, or inflammation of the salivary glands. When parotiditis ensues in the adult, it is apt to produce considerable swelling of the gland, which continues for a long period; in children, inflammation of this gland, and of the submaxillary glands, may give rise to asphyxia, or terminate in suppuration and abscess. Other sequelæ of scarlatina anginosa are, chronic enlargements of the lymphatic glands of the neck, swelling of the testes, chronic bronchitis, chronic diarrhœa, &c., and, according to Dr. Scot Alison,[1] pericarditis.

In scarlatina maligna the sequelæ are severe and dangerous, and often prove fatal after the secondary stages of the fever have subsided. To the tertiary affections above detailed, may be added, as occasionally following in the train of scarlatina maligna, ulceration of the mucous membrane of the larynx, trachea, and œsophagus; ulceration of the mucous membrane of the intestines, protracted cough, dyspnœa, suppuration of the salivary glands, enlargement and suppuration of the lymphatic glands of the neck, sloughing of the nates, and hectic fever.

122. *Diagnosis.*—The especial diagnostic characters of scarlatina are, *firstly*, the decided and acute affection of the fauces; *secondly*, the early appearance (2d day) and rapid extension of the efflorescence; and *thirdly*, the bright scarlet, and diffused character of the rash, and its frequent interspersion with red papulæ.

Between scarlatina and rubeola, the closest analogy undoubtedly subsists, and when the natural characters of the two affections are considered, the analogy approaches almost to identity; thus, both are inflammations of the tegumentary surface of the body internal and external; both are accompanied by a cutaneous efflorescence, involving the vascular rete of the derma; both are liable to be succeeded by serious affections of the viscera, into the structure of which mucous membrane enters as a constituent part; both appear during the prevalence of the same epidemic, engendered apparently by the same infection; one may follow on the other as a consecutive disorder; both are infectious, and both are contagious. In practice alone is it necessary to distinguish between these exanthemata. We will, therefore, inquire what are the distinctions which we are enabled to establish between them?

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[1] Medical Gazette, 1845.

Scarlatina.	*Rubeola.*
1. Precursory symptoms of one day's duration.	1. Precursory symptoms of three days' duration.
2. Mucous membrane of the eyes, nose, and fauces, red and inflamed, without secretion; pain and soreness of throat; no cough; no expectoration.	2. Mucous membrane of the eyes, nose, and fauces, red and inflamed, with increased secretion, coryza, sneezing, &c.; dry cough at first, subsequently expectoration.
3. Eruption on the second day of the fever; invades the entire surface of the body in three days; disappears by the end of the seventh day.	3. Eruption on the fourth day of the fever; occupies three days in invading the entire surface of the body; disappears by the end of the eighth day.
4. The efflorescence occurs in large irregular patches, or is more or less generally diffused; is of a bright scarlet, compared by Willan to a "boiled lobster's shell," and frequently interspersed with numerous small red papulæ.	4. The efflorescence occurs in small crescentic, and circular patches, with intervening unaffected portions of the skin; the colour is darker than in scarlatina, with "nearly the hue of a raspberry," and interspersed with numerous small red papulæ, disposed in clusters.
5. Odour resembling old cheese.	5. Odour, sweetish, until the decline of the eruption, then sourish.
6. Principal sequelæ: anasarca; inflammation of the joints; gangrene; chronic bronchitis; ulcerations of fauces; conjunctivitis; otitis; abscess of salivary glands; chronic diarrhœa.	6. Principal sequelæ: the same as scarlatina, with the exception of anasarca, inflammation of the joints, and gangrene.
7. Exfoliation of the epiderma in laminæ.	7. Exfoliation of the epiderma, in furfuraceous scales.
8. Less infectious and contagious than measles.	8. More infectious and contagious than scarlatina.
9. Rarely attacks the same person more than once.	9. Frequently attacks the same person twice.

The differences above stated amount at most to one of *degree*, the infection being the same in both disorders. Thus, while both are constituted by inflammation attacking the same textures of the body, scarlatina, during its *first stages*, is more rapidly and actively determined to the cutaneous surface, the mucous membrane, in an equal ratio, escaping the violence of the inflammatory action. The contrary is the case with regard to rubeola; here the cutaneous determination is tardy and partial, while the mucous affection is gradual, severe, and prolonged. During the *second stages*, on the subsidence of the cutaneous congestion, the mucous membrane may suffer more or less in both, according to a variety of circumstances, such as the greater or less exhaustion of the morbific influence in the skin, the state of the nervous system, &c. These stages have no natural course in either disorder, new and accidental, or previously existing conditions determining the resolution of the inflammation, or its attack upon some weak point of the mucous membrane.

Scarlatina sine exanthemate is distinguished from cynanche maligna by the symptoms, which indicate the presence of an acute disease, and one producing a powerful impression on the vascular and nervous systems. The alimentary system is also much disturbed; there is vomiting and diarrhœa, and the disease is apt to run its course to a fatal termination in the lapse of a few days, or within the first week. Angina maligna, on the other hand, is slow and gradual in its progress, extending by degrees from the point first attacked along the trachea and bronchial tubes, giving rise to the formation of false membranes in its course, and attended with little constitutional disturbance, however severe may be the local affection. In a word, the observation of these two diseases exhibits, in the former, fatality in its cause; in the latter, fatality in its effects.

123. *Causes.*—The cause of scarlatina is an infection, or contagion, apparently identical with that of rubeola. It makes its attack in the form of an epidemic, and prevails mostly in the spring and autumn seasons of the year. The atmospheric conditions favourable to scarlatina are cold and moisture combined, and the existence of this state of the weather for any time gives rise to a medical constitution, in which scarlatina is apt to be developed. When epidemics of scarlatina and measles occur at successive periods, with an interval of a certain number of years, it would appear that the fresh invasion is determined by an increase in the numbers of the population who have not yet suffered from the disease, and who are consequently susceptible of its influence. Scarlatina is less contagious than rubeola, and affects children and young persons chiefly; but many instances occur in which adults, and especially puerperal patients, have suffered from this disease. Scarlatina rarely attacks the same person more than once, and is less easily communicable by inoculation than measles. For protection against the propagation of the contagion, patients recovering from scarlatina should be secluded for three weeks or a month.

It is worthy of remark, that an angina pseudo-membranosa, complicated in some cases with scarlatina, not unfrequently takes place, on the continent, in an epidemic form. In an epidemic of this disease lately reported to the Academy of Medicine as having occurred at Lion-d'Angers, it prevailed for the first six months of the year. During the same period horses suffered from a similar affection, colts from acute enteritis, and cattle, sheep, and pigs, from phlyctenoid fever.

124. *Prognosis.*—The prognosis of scarlatina will be much influenced by the nature of the prevailing epidemic. It sometimes invades with such overwhelming rapidity as to destroy life before any pathological changes can be effected. Scarlatina simplex is wholly divested of danger when it passes regularly through its course. It may, however, be rendered grave by retrocession, or by complication with disease in any of the viscera. "The prognosis is unfavourable if the delirium commence, as it frequently does in children, and sometimes also in adults, a few hours after the seizure. In these cases the child often dies on the third or fourth day, and the adult on the eighth or tenth. The tongue becoming brown, or, a clean tongue,

with a rapid, fluttering pulse, are unfavourable symptoms. A sudden fading of the eruption, or its changing to a livid colour, are symptoms of danger. The danger of scarlatina is increased by dentition. Pregnancy also adds to the danger, as the woman frequently miscarries. The prognosis is also extremely grave when it attacks women immediately after parturition." "The fauces becoming livid under any circumstances, or an acrid discharge from the nostrils, or else the formation of an extensive abscess in the neck, accompanied with severe purging, are all unfavourable symptoms. The appearance of mortification in any part is commonly, but not universally fatal. Affection of the joints is a grave, but by no means a fatal symptom.[1] The appearance of hemorrhage from the mucous membrane of the nose at the commencement of the exanthema is regarded as a favourable sign."

125. *Treatment.*—The principle of treatment in scarlatina is to endeavour to purify the blood of the morbid poison which it contains, and which is the cause of the disease, by calling into action the various natural emunctories of the system—namely, the skin, the bowels, and the kidneys. The degree in which these powers should be set in action must be determined by the strength of the disease. In the mildest forms of the complaint the treatment should be of the simplest kind. Sydenham remarks that none die of this disorder, except from a too great officiousness on the part of the practitioner—"nimia medici diligentia." The patient should be confined to the house, the sick apartment should be kept well ventilated, the patient's head cool, his feet warm, the bed-clothes light; his diet should be sparing and unstimulating, with an abundant supply of diluent and acidulated drinks; conversation should be prohibited, and all sources of noise or moral excitement removed. To these hygienic means should be added sponging of the skin with tepid vinegar; a daily warm bath, if the process can be accomplished without fatigue to the patient and danger of exposure; mild diaphoretics, if necessary; gentle laxatives; and, at the decline of the fever, a mild tonic, such as the citrate of iron, or citrate of iron and quinine, and a little wine. During convalescence and after recovery, flannel should be worn next the skin.

If the extension of the disease to the kidneys should be indicated by anasarca or the state of the urine, the warm bath must be immediately resorted to. It may be given twice a day, once a day, or every other day, according to the strength of the patient, and the relief it is found to afford; and its action may be increased by antimonial diaphoretics. An active purgative, and such as will relieve the mucous membrane by exciting secretion, at the same time that it moves the bowels copiously, must be administered. Calomel, with the compound jalap powder, saline aperients, or drachm doses of the bitartrate of potash, are the best means for this purpose. And, in addition, the action of the kidneys may be gently aided by mild diuretics, such as the citrate of potash, acetate of potash, or liquor ammoniæ acetatis. But diuretics should be used with caution, judiciously selected and administered. I am of opinion that they would relieve the most congested condition of the kidney; but improperly chosen and mistimed in their exhibition, there would be danger of their increasing the inflammation which they were intended to abate. When symptoms indicate a very considerable congestion of the kidneys, leeches to the loins, sinapisms, or dry cupping, may become necessary. The compound tincture of iodine, containing an additional drachm of iodine to the ounce, I have seen used as a counter-stimulant with great success and relief. It possesses the great advantage of ready application, and may be used without the slightest disturbance of the patient. When symptoms denote effusion into the cranium, or cavities of the brain, sinapisms or a blister should be applied to the nape of the neck.

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[1] Dr. Robert Williams. Opus. cit., p. 145.

During the progress of the above treatment for carrying off the morbid poison, the powers of the digestive organs must be maintained by a nourishing diet; and, as the symptoms subside, wine may be allowed for the same purpose. When the disease is exhausted, the general tone of the system, and especially that of the kidneys, is to be restored by means of mild chalybeate tonics, such as the citrate of iron, potassio-tartrate of iron, citrate of iron and quinine, vinum ferri, tincture of the sesquichloride, sesquioxyde, or iodide of iron; or, as recommended by Dr. Robert Williams, salicine, from combining the properties of a tonic and diuretic, in five-grain doses three times a day.

When the cause of the œdema or anasarca is an anæmic state of the system, tonic remedies are the appropriate treatment, from the earliest indication of the existence of such a state. The tonics best suited to the purpose are, the salts of iron, alone or in combination with a bitter effusion; or the sesquioxyde of iron.

In scarlatina anginosa the same general plan of management should be adopted as in the preceding form, and if the heat of the skin be excessive, great relief will be afforded by sponging with cold or tepid water, vinegar and water, or tepid vinegar. The disposition to nausea which exists in scarlatina anginosa should be met by effervescing salines, such as the citrate of ammonia, combined with laxative doses of neutral salts. But, as the leading feature of scarlatina anginosa is inflammation of the mucous membrane of the fauces, this must be treated by the early application of nitrate of silver in the solid state. Some medical men give a preference to a strong solution, such as twenty or thirty grains to the ounce, applied by means of a sponge, but the solid stick appears to me to be most easily managed. The application should be repeated once or twice a day.

When the tonsils are enlarged and painful, and interfere seriously with respiration, or are accompanied by severe pain in the head, leeches should be applied in the submaxillary region, the number being regulated by the age and strength of the patient. In moderately strong children, ten or twelve may be employed, but the abstraction of blood must be conducted with caution. If there be delirium, the head should be shaved and cold applied. Blisters to the throat are objectionable in these cases, for, by exciting inflammation of the cutaneous surface, they act as additional sources of irritation; the tincture of iodine is not open to the same objection, and is an excellent remedy. So long as the inflammation of the fauces continues, the saline remedies must be pursued; but as soon as the sloughs are thrown off, and ulceration established, and the febrile symptoms are on the decline, tonic medicines, with mineral acids, and wine, are indicated. Acid and astringent gargles or fumigations, or, in young children, aspersion of the throat, with an acid and slightly astringent solution, are often useful in procuring the removal of the viscid mucus and exuviæ which are apt to collect in the fauces and excite nausea. They also serve to remove the fœtor which accompanies the sloughing and ulceration.

Emetics have been recommended very strongly, as a means of clearing the throat of its mucus, and, at the same time, of ridding the stomach of its peccant contents. The violence of the remedy far outweighs the inconvenience which it is proposed to remove, and although supported by the authority of Withering, emetics have fallen into merited neglect. Indeed, they are not merely negative in their effects, but are calculated to be injurious.

Purgatives, like emetics, have been much over-rated in the treatment of scarlatina anginosa. Willan was an advocate for the employment of calomel in purgative doses, with a view to reduce the febrile excitement and heat of surface. Dr. Hamilton also drew a favourable deduction from their use; but Dr. Robert Williams has shown that while the mortality in the cases treated by Dr. Hamilton was twelve in ninety-five, in those treated by moderate stimulants, it was only three per cent.

Dr. Currie, of Liverpool, the celebrated advocate for the employment of cold water in fevers, pursued this practice in scarlatina with remarkable success, washing the surface whenever the skin was "hot and dry." Dr. Bateman, and several other eminent physicians, adopted the practice of cold affusion, and gave the strongest evidence in its favour. The method of using the remedy is, to pour one or two pailfuls of cold water over the patient, to rub him quickly dry, and place him in bed, where in a short space of time he falls asleep, and generally breaks out into a moderate perspiration. If the feeling of cold should continue after the bath, a little warm wine and water is administered to the patient. The effect of cold affusion is, to diminish the frequency of the pulse, to reduce the thirst and heat of skin, and to tranquillize the nervous system. If needful, it may be repeated for a second or a third time. When affusion is not thought advisable, sponging the surface with cold water may be employed as a substitute. "Cold affusion," says Bateman, "combines in itself all the medicinal properties which are indicated in this state of disease, and which we should scarcely, à priori, expect it to possess; for it is not only the most effectual febrifuge, but it is, in fact, the only sudorific and anodyne which will not disappoint the expectation of the practitioner under these circumstances." "Invariably, in the course of a few minutes, the pulse has been diminished in frequency, the thirst has abated, the tongue has become moist, a general free perspiration has broken forth, the skin has become soft and cool, and the eyes have brightened, and these indications of relief have been speedily followed by a calm and refreshing sleep."

Dr. Schneemann, of Hanover, speaks in high terms of eulogium of a very simple treatment—namely, inunction with lard.[1] He says: From the first day of the illness, and as soon as we are certain of its nature, the patient must be rubbed every morning and evening over the whole body with a piece of bacon, in such a manner that a covering is every where applied. In order to make this rubbing-in somewhat easier, it is best to take a piece of bacon the size of the hand, choosing a part still armed with the rind, that we may have a firmer grasp. On the soft side of this piece, slits are to be made in various directions, in order to allow the oozing out of the fat; and this is still further promoted by placing the bacon, for some time previously to using it, near the stove, in the oven, or on the hob, but the fat must be allowed to cool before its application.

The rubbing must be most conscientiously performed and not too quickly, in order that the skin may be thoroughly saturated; and during the process, only that part of the skin subjected to the operation should be exposed. This treatment should be continued night and morning for three weeks, and once a day for the fourth. After that, the patient may be washed daily with cool water and soap, and not until the skin has become accustomed to the cool ablution should the warm bath be commenced.

The advantages of this plan Dr. Schneemann states to be the shortening of the disease to such an extent, that the patient may leave the house at the end of ten days; the checking of all infection by the end of the third or fourth day; the relief of all uneasy and painful feelings in the skin, particularly those that accompany desquamation; the diminution of the amount of desquamation; the prevention of taking cold; and a greater security against complications and sequelæ. The treatment, he observes, is not likely to find much favour with the fastidious, on account of being dirty, but the first few days of its application produce results which make all this forgotten, and inspire mothers with enthusiasm. With a rapidity bordering on magic, all, even the most painful, symptoms of the disease are allayed; quiet, sleep, appetite, and good humour return, and there remains only the impatience to quit the sick-room.

Dr. Mauthner,[2] of Vienna, adds his testimony in favour of the remedy; and from my knowledge of the value of inunction in erysipelas, I am disposed to think most favourably of it. The principle of its action I believe to be the prevention of the too rapid oxygenization of the blood at the surface of the body, and the consequent check to inflammation and its processes in the skin, one of the most important of these processes in diseases depending upon an animal poison being an augmentation of that poison. My friend, Mr. Grantham, of Crayford in Kent, has for many years past relied on inunction in the treatment of violent sprains, and, at his recommendation,

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[1] On Scarlet Fever, by Dr. Schneemann, translated by John L. Milton, M.R.C.S.E. *Lancet*, September 15, 1849.

[2] Revue Medico-Chirurgicale, 1849.

I have pursued the plan with extraordinary success; the principle is the same, and falls into the same category as mercurial inunction in small-pox.

Belladonna has obtained a high reputation among continental practitioners for its protective and curative powers in scarlatina. It was first suggested in 1807 by Hahnemann, who had observed that all persons to whom this medicine had been given were preserved against the infection of scarlet fever. Several German physicians, who have recorded their experience in *Hufeland's Journal*, unite in praise of belladonna; one gentleman remarks that, during an epidemic of scarlatina, 14 children, out of 195 exposed to the contagion, alone took the disease, and those were but slightly affected; another expresses his opinion that belladonna may be considered as being as successful against scarlatina as vaccinia against small-pox. Several repeat the observation of Hahnemann, that the medicine produces an efflorescence on the skin similar to that of measles; children in whom this efflorescence appears are at once regarded as safe. The reporters exhibit some disagreement in reference to the strength of the remedy: one recommends a solution of three grains of the extract to an ounce of cinnamon-water; and of this solution he gives two or three drops to infants under a year, three or four drops during the second year, increasing the dose progressively until twelve years, at and after which period he administers twelve drops: another makes a solution of one grain to a drachm of water, and states the dose at ten to twenty drops, meaning, I apprehend, for an adult. Both these gentlemen prescribe the remedy twice a day; while a third thinks it desirable to administer it four or five times a day, of course in corresponding doses. Dr. Schneemann, the originator of the inunction treatment, proposes a solution of two grains of the extract in an ounce of cinnamon-water, and recommends as the proper dose as many drops, morning and night, as the child has years. The remedy should be continued, he observes, for at least fourteen days.

Belladonna may also be given with advantage after the attack and during the progress of the fever, in doses of half a grain to two or three grains, according to the age of the patient, every three or four hours.

Both cold affusion and belladonna appear to me to act therapeutically, by virtue of their sedative effects upon the nervous system, and upon the same principle, any sedative means from which the stimulant property were as much as possible excluded would ensure the same desirable end. Cold affusion has been used with great advantage in fevers, and the sedative powers of opium have lately been employed in France for the purpose of checking inflammatory action.

Dr. Sims remarks, in relation to prophylactic treatment, "The best preventive to the disease I found to be rhubarb, taken in the quantity of a few grains every morning, so as to produce one laxative motion in the day. I did not see one who used this confined afterwards to bed, though several persons began it after they were infected, but before the time of their sickening."

127. *Scarlatina maligna.*—The vast depression of the powers of

the nervous system that exists in scarlatina maligna indicates a tonic plan of treatment, conjoined with a proper regulation of the digestive system by means of gentle laxatives and attention to the local disorder of the throat. The best tonic remedies are quinine with infusion of roses and dilute sulphuric acid, gentian with nitric and hydrochloric acids, cascarilla, hops, or canella. The tonic and nutritive properties of wine or good beer render them invaluable remedies in these cases; the quantity which may be taken daily by a child amounts to one or three ounces, and by an adult to double that quantity. The application of leeches to the throat is contra-indicated in the malignant form of scarlatina, and, indeed, no symptoms present themselves to warrant their use. The same objections oppose the application of blisters and counter-irritants. The fauces should be fumigated with the steam of warm vinegar, with decoctions of contrayerva and bark, acidulated with acetic acid, or containing camphorated spirit; or gargled with a weak solution of chloride of lime or capsicum pods. Dr. Watson remarks, that a great improvement upon the old plan of capsicum gargles, is a weak solution of common salt either used as a gargle, or, if the disease occur "in a child that is not able to gargle, this solution may be injected into the nostrils and against the fauces by means of a syringe or elastic bottle. The effect of this application is sometimes most encouraging. A quantity of offensive sloughy matter is brought away; the acrid discharge is rendered harmless; the running from the nose and diarrhœa cease; and the disease is converted into a form which approximates to the scarlatina anginosa." The surface of the body may be sponged with warm vinegar, but the use of cold water, so agreeable and beneficial in scarlatina anginosa, is painful and injurious in the malignant form.

"Of late," observes Dr. Watson, "I have been in the habit of directing a solution of the chlorate of potash in water (a drachm to a pint) as a *drink* for patients in scarlet fever and in the typhoid forms of continued fever. This practice was suggested to me by Dr. Hunt, who tells me he has long employed it with advantage. Under the use of a pint or pint and a half of this solution daily, I have remarked in many instances a speedy improvement of the tongue, which from being furred or brown and dry, has become cleaner and moist." Dr. Watson also remarks that the solution of chlorine has been strongly pressed on his attention as a praiseworthy remedy. "Two drachms of the chlorate of potash are to be dissolved in two ounces of hydrochloric acid previously diluted with two ounces of distilled water. The solution must be put immediately in a stoppered bottle and kept in a dark place. Two drachms of this solution mixed with a pint of distilled water, constitute the chlorine mixture; of which a table-spoonful or two, according to the age of the patient, may be given for a dose, frequently."

128. *Scarlatina sine exanthemate* will require the treatment adapted for scarlatina anginosa or scarlatina maligna, according as it may put on the characters of either of the preceding forms. With the view of encouraging the development of the eruption, the skin should be stimulated by a warm bath or mustard bath, by frictions with irritating applications, and by blisters.

The *retrocession* of the cutaneous efflorescence in scarlatina should be treated with mustard baths, the application of blisters, and the friction of stimulating liniments on the skin. An eruption, evincing a disposition to metastasis, may frequently be fixed by means of a blister.

129. *Complications of scarlatina.*—The complications of scarlatina call for a treatment especially directed to the organs affected. Thus, when from the presence of delirium, comatose symptoms, &c., without much inflammation of the fauces, we are led to infer congestion of the brain, leeches should be applied to the temples or to the mucous membrane of the nose, in imitation of the critical hemorrhage which frequently occurs at the close of the disorder; and blisters should be placed behind the ears, or upon the nape of the neck. But when these symptoms are associated with inflammation of the fauces, the most ready, and indeed the only method of relieving them is to apply the leeches to the submaxillary region. It must, however, be borne in mind that the delirium of scarlatina is very frequently an indication merely of irritation of the nervous system, and not of congestion; in which case the treatment must consist of opiates instead of depletory remedies. When respiration is obstructed from congestion or œdema of the mucous membrane of the larynx or trachea, leeches should be applied over this region, and in very severe cases it may be necessary to perform tracheotomy. When the lungs or pleuræ are affected, leeches to the chest, with blisters or sinapisms, are required. When the stomach appears to be the seat of congestion, leeches to the epigastrium, and a blister or sinapism, will facilitate its restoration. Diarrhœa is to be relieved by leeches or fomentations to the abdomen, succeeded by sinapisms or a blister; and the same plan is requisite when the kidneys are the organs especially disordered, the therapeutic management in the whole of these cases being aided by mustard foot-baths. The cure of ulcerations in the fauces is best effected by means of a solution of nitrate of silver applied with a sponge; or by the same salt in powder blown upon the ulcerated surfaces through a quill.

130. The inflammation of the joints that so frequently succeeds to scarlatina, is combated by means of gentle purgatives, some simple sedative to relieve pain, and fomentations to the diseased articulations. Other sequelæ should be treated according to the general principles of therapeutics.

VARIOLA.

Syn. *Small pox. Variole; Petite vérole*, Fran.—
Kinderpocken, Kinderblattern, Germ.

131. Variola is an acute inflammation of the tegumentary investment of the entire body, both cutaneous and mucous, associated with fever of an infectious and contagious kind. On the skin it is characterized by an eruption of red points, which pass through certain stages of progressive development, becoming, in quick succession, pimples (vari,) acuminated vesicles, flattened and umbilicated vesicles, pustules, and hard brown scabs; the latter falling off from the eleventh to the twenty-fifth day, and leaving behind them small irregular pits, and

permanent cicatrices. On the mucous membranes it produces great congestion of the surface, and in some situations pustules, particularly in the respiratory passages. The fever of variola is of the remittent type, preceding the eruption for two, three, or four days, ceasing as soon as the eruption is developed, and returning when the eruption has reached its height—namely, on the eighth day in discreet, and on the eleventh day in confluent small-pox.

132. Small-pox admits of several divisions in relation to the origin, distribution, and degree of severity of the disease. In respect of origin, it may occur sporadically, or be the consequence of the voluntary introduction of the variolous virus into the system, constituting the two varieties termed *natural small-pox* and *inoculated small-pox*. In reference to distribution and degree, the eruption of small-pox may be *discreet*, the pustules being distinct and scattered over the surface of the body; it may be *coherent*, the pustules being very numerous, and, in many situations, placed closely side by side, but still distinct; it may be *confluent*, the pustules being very numerous, and, in several situations so closely set, as to run one into the other, and form confluent clusters of various size; or it may be *modified*, the pustules being altered in their number, their size, and their course, either by the previous invasion of small-pox, natural or inoculated, or by vaccination. Modified small-pox is a much milder affection than the parent variola, and is termed varicella, or varioloid. Another division of variola relates to its occurrence for the first time, or as a second attack, a distinction which is expressed by the terms *primary* small-pox, and *secondary* small-pox. Besides the preceding, we sometimes have occasion to remark, during the prevalence of an epidemic of variola, the occurrence of the fever of small-pox, without its eruption; this variolous fever constitutes a variety which has been appropriately termed, *variola sine variolis*. These terms, expressive of differences in the character of variola, are chiefly useful for the purposes of communication and description. They may be comprehended at a glance, by placing them in a tabular form; thus,

- Natural variola—
    - Discreet.
    - Coherent.
    - Confluent.
    - Modified.
    - Secondary.
- Inoculated variola.
- Variola sine variolis.

133. The course of variola admits of consideration in five successive periods, this division being alike convenient in the treatment and description of the disease. The periods of variola are those of incubation, invasion, eruption, suppuration, and desiccation.

I. The *period of incubation* is of variable duration, and comprehends all that space of time which intervenes between the exposure of the body to infection or contagion, and the invasion of the disease. In very severe cases the period of incubation is short; in the milder forms, on the contrary, it is long. The limits commonly assigned to this period are from five or six to twenty days, and cases sometimes occur in which it would seem to be still further prolonged.

II. The *period of invasion* is marked by symptoms which indicate serious constitutional disturbance. It commences with languor and lassitude, with shivering and horripilation, pains in the head, in the loins[1], and in the limbs; the skin is hot, and either dry or moist; the conjunctivæ suffused; the pulse and respiration quickened; there is thirst and loss of appetite, with a white and coated tongue, dotted with red papillæ; nausea, often vomiting, constipation, pain and heat at the epigastrium, restlessness, and universal prostration. To these succeed, though various in degree in different individuals, oppression of breathing, cough, lethargy, and sometimes coma. The tongue, at the commencement of this period usually white, soon becomes red at the point, and subsequently over its entire surface. In children, convulsions not unfrequently ensue at this stage of the febrile symptoms. Throughout all the periods there is exacerbation of the febrile symptoms during the night.

In confluent small-pox the symptoms of invasion attain their highest degree of severity, there is more sickness and vomiting, the prostration of the system is greater than in the discreet variety; the tongue and lips are parched, and covered with sordes; the heat of skin is excessive; convulsions are more frequent, and sometimes there is diarrhœa.

The period of invasion lasts from two to four days, and its symptoms are instantly relieved by the succession of the eruptive period.

III. The *period of eruption* is often ushered in by a manifest exacerbation of the constitutional symptoms, which are at once and immediately relieved by the outburst of the eruption; the oppression and languor are no longer felt, the nausea and sickness cease, the pulse returns to the natural standard, and is full and regular. The eruption first appears upon the lips and forehead, and then upon the rest of the face; from the face it proceeds to the neck and arms; from the latter to the trunk, and from the trunk to the lower extremities, the entire body being pervaded in the brief space of twenty-four hours.

The development of the eruption is indicated by the appearance of small red points,[2] conical in their form, and hard to the touch, which are disseminated over the surface in numbers proportionate to the subsequent pustules. Thus, in the discreet variety, the spots are few and distinct; in the coherent kind, they are numerous and clustered (corymbose,) like the patches of rubeola; while in confluent variola, they are closely aggregated, and so abundant as to diffuse a general redness over the surface. The skin is hot, tense, and shining. The red spots soon become raised, and by the second day of eruption (fourth or fifth of invasion) have the appearance of small conical papulæ (vari,) with red and inflamed bases, and transparent and vesicular points. On the third, fourth, and fifth day of eruption (fifth to ninth of invasion,) the papular elevations, with their inflamed bases, go on progressively enlarging, the vesicles pass from a conical into a depressed and indented or umbilicated form; their contents, which were at first transparent liquor sanguinis, become whitish and milky, and a thin layer of white lymph is formed on the derma. The umbilicated character is apparent in many of the vesicles on the third day of the eruption, and by the fourth or fifth, a distinct areola is apparent around each.

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[1] M. Chomel regards the pain in the loins, which he refers to the kidneys, as pathognomonic. Dr. Heberden observed that acute pain in the loins was generally followed by a severe attack of the disease; when the pain was higher in the back the disorder was milder; and that the most desirable indication was the absence of pain. Mr. Marson, of the London Small-Pox Hospital, considers the pain in the loins to result from the passage of the variolous poison through the vessels of the kidney, and thus exciting a painful state of the nerves of that organ.

[2] By some writers these points have been compared to the spots produced by the bite of the flea.

Similar phenomena may be observed to be taking place at the same time in the mouth and pharynx; the mucous membrane is red, swollen, and congested; there is soreness in the throat, and painful deglutition; the respiration is somewhat impeded in consequence of the extension of the inflammation to the larynx and trachea; the voice is hoarse and weak; and there is frequently a hard, dry, and troublesome cough. The eruption is developed in the larynx and trachea, on the pharynx and fauces, and on the tongue, in the form of white points, which become converted first into vesicles, then into pustules.

In the confluent variety, the remission of febrile symptoms is imperfect, the eruption appears a day earlier than in the discreet form, the papulæ are less raised, but so numerous as to give rise to a general swelling of the skin, which is of a deep red colour, shining and granulated. The incipient pustules constitute one continuous vesicle over the inflamed surface, formed by the effusion of liquor sanguinis or coagulable lymph beneath the epiderma. This fluid, at first transparent and limpid, becomes milky and opaque, and a thin whitish pellicle of false membrane is deposited on the derma, and may be seen through the raised epiderma.

The confluent and the discreet variety of small-pox frequently occur together in the same individual, the eruption being confluent on the face,[1] and discreet on the rest of the body. When the confluent form extends to the mouth and pharynx, the mucous membrane is covered with pustules, deglutition is rendered exceedingly painful, and respiration is seriously impeded. In the trachea the eruption gives rise to cough, and in the nasal passages to sneezing and catarrh. On the eyelids the pustules produce great tumefaction, and severe inflammation of the conjunctiva.

The eruptive period occupies five days; one corresponding with the varous stage, and the four following with the vesicular stage.

IV. The *period of suppuration or maturation* commences on the sixth day of eruption (ninth or tenth of invasion,) by augmentation of the contents of the vesicles, and conversion of their contained lymph into pus. As a consequence of this change, the vesicles lose their umbilicated character; they become spheroidal and flattened, and their whitish appearance gives place to a tint of yellow of increasing depth. Maturation is complete on the eighth day of eruption. On the eighth day, also, the secondary fever is developed, and continues until the eleventh, during which time the pustules burst, and give exit to a portion of their contents; the period of desiccation is then established.

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[1] The eruption is always most confluent on those parts of the body where some external source of irritation is added to that of the disease. Hence the eruption is always most abundant on the face, the hands, the buttocks and inner sides of the thighs in children, &c. Sydenham remarks, that if there be 10,000 pustules on the entire body, 2000 of these will occupy the face.

In the confluent variety, the inflammation, instead of being confined to a number of distinct points, is distributed over a large surface; isolated pustules, consequently, are not formed, but the production of pus occupies a district of considerable extent. On the face, the raised epiderma frequently begins to desiccate into a thin yellowish crust before the formation of pus is completed; the pus in this case is effused beneath the crust, giving to it additional thickness, and a characteristic brownish hue.

Suppuration is first perceived on the face, whence it extends to the rest of the body, showing a disposition to affect those parts first which possess the thinnest and most delicate skin. For this reason it is that the feet and hands are the parts last observed to undergo the suppurative change. The completion of the suppurative stage on the eighth day of eruption is attended with considerable pain and throbbing, with a vivid redness of the skin, with great tumefaction, and a distressing sensation of tension of the integument. The swelling affects, in the first instance, the head and face, from these it extends to the trunk and limbs, and from the latter to the hands and feet. The eyelids are often so much swollen as completely to bury the eyes; the nose and lips are much enlarged; there is swelling and congestion of the mucous membrane of the mouth, and (in the adult) profuse salivation; the lining membrane of the alimentary canal sympathizes in the general irritation of the mucous surfaces, as may be inferred from the presence of diarrhœa. And the nervous system is greatly depressed, as is shown by the listlessness and lethargy which are conspicuous at this period.

With this extreme of local disorder, the *secondary fever* is established, and continues unabated until the close of the eleventh day of eruption. In mild cases this stage is accompanied by moderate delirium. But in more severe cases, the tongue becomes brown, the symptoms assume the low typhoid type, there is hard cough, with hæmoptysis, and sometimes hæmaturia.

In confluent small-pox, the secondary fever is not developed until the eleventh day; the symptoms are severe, and are often accompanied by restlessness, which increases towards night. This state of restlessness is a dangerous symptom.

V. The *period of desiccation* is indicated by subsidence of tumefaction of the skin, by the drying up of the pus and purulent discharge produced during the preceding period, and by the conversion of these fluids into scabs of various thickness. Desiccation commences on the face much earlier (eighth day of eruption) than on the rest of the body, and it not unfrequently happens that crusts are present in this region before the pustules have attained maturity on the limbs. The crusts are formed in two ways, either by rupture of the pustules and desiccation of the purulent discharge which is poured out by the exposed and ulcerated surface, or by the desiccation of the entire pustule with its investing epiderma. The former is the more frequent method of their production. When the crusts fall, an event that occurs upon successive parts of the body, from the eleventh to the fourteenth day of eruption, the skin beneath is of a bright red colour, retaining this hue for several weeks, and the newly-formed epiderma is thrown off by repeated desquamation. The cicatrices also which have been produced by the ulcerations now become apparent.

In the confluent variety, as has been already remarked, the crust on the face commences to be formed before the completion of the suppurative process, often as early as the eighth or ninth day of the eruption. This extensive crust forms a complete mask to the features, and remains attached for ten or twelve days. When it falls off, the skin beneath presents a vivid red colour, and desquamates freely, bringing into view a surface too frequently disfigured with deep pits, and seamed with extensive cicatrices. The crusts of confluent small-pox are soft and sodden with the fluids poured out by the inflamed skin, and their fall is not completed till the twentieth or twenty-fifth day.

The desiccation of the pustules of small-pox is attended with severe itching, which induces the sufferer to scratch, and often to tear the surface with his nails. By this proceeding hemorrhage takes place from the ulcerated surface, and the drying of this fluid gives rise to a black discoloration of the scabs which form over the wounded parts. The desiccation of the pus and of the purulent discharges is attended by a nauseous and offensive odour.

It is remarked by Simon, that the urinary secretion in variola undergoes changes having relation to the various stages of the disease. That, in the beginning, when the fever assumes the character of synocha, the urine is diminished in quantity, and increased in specific gravity; its colour is deep and red; it is frequently turbid, and often contains a small quantity of albumen. In the eruptive stage, as ascertained by Becquerel, in five cases, in which the symptoms were severe, "the urinary secretion was diminished, and amounted on an average to only 23·5 ounces in twenty-four hours. The specific gravity had not, however, increased so much as might have been supposed, being only 1020·6. It frequently threw down uric acid precipitates, either spontaneously, or on the addition of nitric acid, and in one case a little albumen was observed." "According to Schönlein, in the first stage of variola it is of a reddish brown tint; on the third or fourth day a sweat of a peculiar and strong odour is observed, and the urine contains a turbid, apparently purulent mucous sediment, of an unpleasant odour.

"During the suppurative stage of variola, Becquerel observed that the urine retained the synochal character as long as the symptoms continued." And in cases in which this fever persisted until death, the state of the urine also remained the same. Sediments and frequently purulent mucus occur in the urine of this period.

"During the period of desquamation the urine is either normal or anæmic."

In the nervous form of variola the urine is very changeable, and often dark. "In the putrid form the urine appears decomposed, ammoniacal, and not unfrequently of a dark red colour, from the presence of hæmatin."[1]

INOCULATED VARIOLA.

134. The intent of the operation of inoculation is to bring some portion of the fluid contained within the small-pox vesicle into relation, either with the papillary surface of the derma, or with the tissues situated immediately beneath the epiderma of a sound person. When this object has been effected, the inoculated particles dissolved in the fluids of the tissues are conveyed by imbibition into the system, and communicate to the whole mass of the blood a disposition to the production of matter of a similar kind.

135. The local signs indicating that the inoculation has taken effect, are first perceived on the third day from the operation, when a slight blush of redness is seen around the puncture; this is accompanied by a trifling degree of itching, and the skin feels hard and dense when touched with the finger. On the fourth and the fifth day these signs continue gradually to increase; there is a sensation of prickling and tingling in the inoculated spot, and a small elevation begins to be formed in the centre of the areola. On the sixth day an incipient pustule is formed by the effusion of liquor sanguinis beneath the epiderma; the vesicle at this period begins to be depressed at its centre, and to assume the umbilicated appearance. On the seventh day, there is tenderness of the integument around the vesicle, and some degree of pain is felt upon moving the arm; the vesicle itself begins to look whitish and opaque; the contained lymph quickly gives way to the formation of pus, and the vesicle is surrounded by a purplish areola. By the ninth or the tenth day the pustule has lost its umbilicated character, and has attained its perfect development. After the completion of the pustule, the areola declines in redness, and its contents desiccate, the desiccation taking place during the period intervening between the twelfth and the fifteenth day, and forming a scab of a deep brown colour, and considerable thickness. The crust is thrown off from the twentieth to the twenty-fifth day, and is succeeded by a strongly marked cicatrix, which remains apparent for the rest of life.

136. The period of invasion of the constitutional symptoms in inoculated small-pox usually commences on the ninth day. They resemble in character those of sporadic variola, but are mild, and sometimes so slight as to be scarcely recognisable. Instances are occasionally met with in which the symptoms of invasion are developed, and followed by eruption, without any signs of inflammation in the part inoculated, and consequently without the formation of a pustule.

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[1] Simon, Am. Ed.

137. The period of eruption in inoculated small-pox is irregular in its occurrence, appearing generally on the second or third day from invasion, or on the eleventh or twelfth from inoculation. Occasionally it is observed at the end of a week after inoculation, and sometimes it is protracted to a fortnight. The eruption is ordinarily very slight, sometimes failing altogether, or being scarcely perceptible; while, in rare instances, the eruption may occur at several successive periods, or the confluent variety of eruption be developed.

The eruptive period of inoculated small-pox is sometimes complicated with an erythematous inflammation of the skin, constituting variolous roseola.

VARIOLA SINE VARIOLIS.

138. This form of variola is rare; it has, however, been occasionally observed during the prevalence of an epidemic of variola, and is characterized by the presence of the constitutional symptoms and mucous inflammation of that disease without the cutaneous eruption. Sydenham assigned to this affection the name of variolous fever, and the accuracy of his observations has been confirmed by subsequent writers. Rayer remarks that he has never seen an instance of this variety of small-pox.

COMPLICATIONS OF VARIOLA.

139. Hitherto the favourable course only of variola has been described, but the disease is not unfrequently attended with *complications*, which give it the character of a dangerous and, often, fatal disorder. These complications may occur during any one of the five periods into which the progress of the affection has been divided.

Instead of pursuing the milder course above indicated, the period of invasion is occasionally marked by symptoms of excessive severity, the accompanying fever runs high, the rigor which precedes it has been long and enduring, and the pains in the head, the chest, the præcordia, and the loins, are so violent as to lead to the suspicion of inflammation of organs situated in those regions. There is sometimes delirium and coma, at other times convulsions; and death may occur before the eruptive stage is established. In cachectic states of the system the period of invasion is sometimes complicated with passive hemorrhages from the mucous membranes and from any trifling wound of the skin, and by petechiæ in the tissues of both structures.

The period of eruption like the preceding is liable to its accidents; instead of the favourable course already noted, serious congestions of one or more of the internal viscera may ensue. Sometimes the congestion is directed upon the brain and spinal cord, producing twitching of muscles, restlessness, convulsions, or coma; sometimes on the lungs, causing bronchitis, pneumonia, or pleurisy; sometimes on the mucous membrane of the alimentary canal, giving rise to diarrhœa, dysentery, or hemorrhage; and sometimes upon other of the abdominal organs. In cachectic diatheses, passive hemorrhages and petechiæ may accompany this period; and under any of the above complications, the case may prove fatal before the completion of the eruption. The eruptive process is liable to suffer seriously by these complications; thus, the variolous vesicles, instead of progressing, become stationary and flaccid, or distended with a sanguinolent and serous fluid.

The period of suppuration, as it is the most severe in its symptoms, is also the most dangerous in its complications, and the most frequently fatal in its results. Alarming symptoms sometimes appear with astonishing rapidity, and destroy life in a few hours, or even in a shorter period. Affections of the brain, of the larynx, and of the trachea, are most to be apprehended during this period. When these secondary affections are severe, the pustules remain stationary, or become flaccid, or are converted into sanguinolent bullæ; sometimes they are accompanied by petechiæ and passive hemorrhages, and in rare cases disappear by the absorption of their purulent contents. The latter occurrence is always fatal. Other dangerous indications of this period are, the absence of tumefaction and redness of the skin, the absence of salivation, the appearance of the brown tongue of low typhus, restlessness and anxiety, mortification of any part of the skin, &c.

The termination of variola is a period of much anxiety; for when the disorder has run favourably through its stages, and the danger of the disease has apparently passed away, secondary affections are not uncommonly developed, as consequences of the variolous inflammation. Such are, chronic inflammation of the various mucous membranes, producing deafness, ophthalmia, opacity of the cornea, staphyloma, œdema glottidis, hæmoptysis, pulmonary tubercles, chronic bronchitis, pneumonia, pleuritis, empyema, chronic diarrhœa, &c., glandular enlargement, caries of the bones of the face, subcutaneous abscesses, furuncles, erysipelas, gangrene of the skin, disease of joints, menorrhagia, miscarriage, hæmaturia, abscess of the kidney, and numerous other sequelæ. The cause of these various complications must be referred to some peculiarity of constitution, and cannot be explained by ordinary circumstances. Sometimes they would appear to depend on the vicissitudes of season, the depth of winter and the height of summer being most frequently attended by adverse consequences.

Variola is occasionally complicated with rubeola and scarlatina, and sometimes with petechiæ. The latter form of small-pox is very severe in its affection of the mucous membranes and viscera, but the cerebral symptoms assume a milder type.

140. *Pathology.*—On examination after death of those who have fallen victims to small-pox, several of the internal organs are found to present traces of congestion, particularly the brain, the lungs, and the surface of the gastro-intestinal mucous membrane. The tissue of the lungs is generally found congested and infiltrated, and the serous coat of the blood vessels is stained of a deep red colour. Pustules are discovered upon the mucous membrane only when the patient chances to perish at the commencement of the suppurative stage. At a later period they are usually lost, on account of the early rupture of the epithelium, which, from its thinness and softness, is less resistant than the horny epiderma. For the same reason, pustules upon the mucous membranes never attain a size equal to those of the cutaneous surface, and rarely contain pus. When ruptured, the surfaces

occupied by these pustules are found to be covered with loose laminæ, and shreds of false membrane.

The situations in which pustules have been observed on mucous surfaces are the extremities of the alimentary canal, where the epithelium is thick—namely, in the mouth, pharynx, œsophagus, and rectum; Rostan detected them throughout the entire intestinal canal; on the respiratory mucous membrane—namely, in the larynx, trachea, and bronchi, and in the urinary bladder.

141. The form of the pustule of small-pox is strikingly modified in reference to the seat of its development. Thus on the face, where the pustules advance very rapidly to maturity, they are flat and non-umbilicated. On the palms of the hands, and on the palmar surface of the fingers, they rise gradually from the surface, are but little raised above the level of the surrounding skin, and are also non-umbilicated. On the soles of the feet, again, they are large in extent, and still more flat than the preceding, appearing like purplish disks with a distinct white margin, and non-umbilicated. Usually, the umbilicated centre presents a reddish or brownish tint, and sometimes, though rarely, it is perforated by the shaft of a hair.

142. When a well-formed and mature pustule is examined by dissection, it is found to be divided in its interior by a transverse septum into two chambers, both containing pus. The upper chamber is the larger of the two, and they communicate with each other, to a greater or less extent, by the rupture of the transverse septum around its marginal border. The epiderma, forming the superficial boundary of the pustule, is the segment of a sphere, and continuous by its circumference with the cuticle covering the adjoining skin. The transverse septum is a layer of false membrane, of a whitish colour, which was deposited on the derma at an early stage of the pustule. Subsequently this layer becomes separated from the derma, and raised by the formation of pus beneath it, and at the same time it is broken around its edges, and permits the pus of the deeper cavity to communicate with that already contained in the superficial chamber. In consequence of the peculiarity in the mode of its production, this layer of false membrane generally retains permanently the umbilicated form of the primitive pustule, and is thinner at the centre than towards its circumference. When the septum is removed, the deep chamber is brought into view, and the depressed and sometimes ulcerated base of the pock exposed. The surface of the base is of a bright or purplish red colour, and highly vascular.

Some difference of opinion subsists with regard to the cause of the umbilicated appearance of the pustule of variola during its early stages. Dr. Heming many years since attributed it to the perforation of the pustule by the efferent duct of a sebiparous gland. Velpeau, who believes that the principal seat of small-pox is in the follicles of the derma, would, I suppose, entertain the same opinion. Other writers believe it to be produced by the pores of the skin, and Rayer refers it to the attachment of the false membrane. I agree with Velpeau that the follicles of the skin are the primary seat of the vascular congestion, that this congestion gives rise to the production of the papules or vari, and consequently that the epidermal sheath of the follicle is the probable cause of the umbilication of the small-pox vesicle. When the vesicle is examined at its height of development, it is found to be multilocular in its structure, and, when divided by a transverse section, exhibits an appearance which Gendrin has compared to a spice-box, while Bousquet likens it to a severed orange.

143. *Diagnosis.*—The precursory symptoms of small-pox are liable to be mistaken for simple fever, or inflammation of such of the viscera as may chance to be most affected. Pains in the loins, according to Chomel, are pathognomonic; vomiting is more frequent, and the pains in the limbs are somewhat greater than in other exanthemata, and convulsions in children are more frequent. The prevalence of an epidemic of this disease, or the previous exposure of the individual to the influence of contagion, are alone calculated to raise suspicion in the mind of the practitioner until the true nature of the symptoms is confessed by the appearance of the eruption. When first developed, the eruption presents considerable resemblance to rubeola, but from the latter it may be distinguished, as well by the nature of the previous symptoms, as by the more decidedly papular character of the eruption, and the rough sensation which the papulæ communicate to the finger.

It is utterly impossible to confound the mature pustules of small-pox with any of the pustular affections of the skin.

144. *Causes.*—It is affirmed by Mr. Moore, in his "History of Small-pox," that this disease existed in China and Hindostan, more than 1000 years before the birth of Christ. After a long period, it appears to have made its way into Arabia, and to have shown itself in the Arab host at the siege of Mecca, in the year of the birth of Mahomet, 569. Pursuing the track of armies, we find it raging in Egypt in 640, and subsequently following the victories of the Saracens in the eighth century, through Italy, Spain, and France. By the Saracens, the disease was communicated to the Crusaders, and the latter caused its rapid spread throughout Europe. "There was no small-pox in the new world before its discovery by Columbus in 1492. In 1517, the disease was imported into St. Domingo. Three years later, in one of the Spanish expeditions from Cuba to Mexico, a negro, covered with the pustules of small-pox, was landed on the Mexican coast. From him, the disease spread with such desolation, that within a very short time, according to Robertson, three millions and a half of people were destroyed in that kingdom alone. Small-pox was introduced into Iceland in 1707, when 16,000 persons were carried off by its ravages; more than a fourth part of the whole population of the island. It reached Greenland still later: appearing there, for the first time, in 1733, and spreading so fatally as almost to depopulate the country."[1]

Small-pox occurs at all periods of life, from the fœtus in the womb to the last hours of senility. It is developed equally in the two sexes, in all seasons, and in all climates. It may appear as a sporadic affection, or epidemically. In the latter form, its invasion is most frequently observed in the summer, or the autumn season.

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[1] Dr. Watson's Lectures, Am. ed.

The cause of small-pox is a specific animal poison;[1] the period when transmission is most likely to happen being the suppurative stage, and when developed epidemically, it is propagated in the direction of the prevailing winds. As a general rule, small-pox attacks but once in a life-time, but against this rule many exceptions have been recorded. Instances have been observed, in which the disease has invaded a second, a third, and even so often as a sixth time. Sometimes the subsequent attack is as severe as the first, but usually the secondary affections are remarkable for mildness and rapidity of course.

The protective agency of an attack of variola against subsequent invasions of the disease, was known at a very early period in medical history; thus, inoculation was practised in Constantinople in 1673, and the practice was subsequently introduced by Lady Montague into England, whence it extended to the continent of Europe. The intention of inoculation is to produce an attack of the disorder, at a period when the physical powers are sound, and capable of resisting its influence, by means of inoculation. Moreover, it is found that the inoculated disease is always more mild than the sporadic affection. Several serious objections, however, raise themselves against inoculation, and one of these so great as to have been deemed worthy of a restrictive act of the legislature. The most obvious reasons that oppose themselves are—firstly, that the system is equally, perhaps more safely, protected by the milder operation of vaccination; and, secondly, that inoculation often produces a severe and dangerous disease. But the most important objection to the continuance of the practice is, that the small-pox engendered by inoculation may be communicated to others by contagion; and, consequently, that one such case may become the source of a fatal and devastating epidemic. An instance of this kind is related in the memoirs of Maria-Theresa of Austria, who having inoculated a number of children, the small-pox was communicated by the latter to an entire village.

145. *Prognosis.*—In the discreet form of variola, or when the eruption is slight, and its course mild, the prognosis is favourable, the disease usually terminating in from two to three weeks. In the confluent form there is considerable danger, and the disorder requires to be watched with care, for symptoms of a fatal nature are apt to show themselves suddenly and unexpectedly, and the disease is prolonged to three or four weeks. Small-pox is of unfavourable prognosis when it presents irregularities in its course; when it is complicated with much cerebro-spinal or pulmonary irritation; when the pustules contain a sanguineous fluid, or are intermingled with petechiæ; when the eruption is associated with debility of system in the patient, or with signs of violent depression, as fear, &c.; when the pock does not pass regularly through its stages, or when the persons affected are plethoric, and unused to disease.

146. *Treatment.*—The uncomplicated form of small-pox requires

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[1] Several authors have imagined the cutaneous eruption of small-pox to depend upon the presence of minute animalcules; but careful observation affords no ground for this supposition.

the most simple plan of treatment—namely, confinement to bed, diluents, cooling regimen, cool and equable temperature, frequent change of linen, and an attention to symptoms as they arise. Meddling in variola is calculated to be as injurious as in other eruptive diseases depending for their origin on a specific poison; and it must be borne in mind, that any vascular determination to the surface, whether internal or external, will be followed by an increase in the number of pustules developed on the irritated spot. Thus an incautious purgative at the outset of the fever may induce so great a congestion of the mucous membrane of the alimentary canal as may terminate seriously.

The treatment of variola in its simple form is consequently expectant; very little is required of the practitioner during the fever of invasion beyond the maintenance of a cooling regimen, keeping the bowels gently open by saline purgatives, and sponging the skin with tepid water.

At the commencement of the secondary fever, the proper remedies are febrifuge salines, such as the liquor ammoniæ acetatis, or effervescent salines; and at a more advanced period a continuance of gentle laxatives or enemata, and opiates to relieve restlessness, sleeplessness, and nervous symptoms. Should the powers of the system seem to require support, this is the period when wine and a more nourishing diet may be allowed; the effects of the wine being carefully watched.

If the cerebro-spinal system be much disturbed, leeches to the mucous membrane of the nose or behind the ears, with mustard foot-baths are indicated; gargles for inflammation and dryness of the mucous membrane of the mouth and fauces; leeches to the epigastrium for pains in that region, with violent vomiting; mineral acids with infusion of roses, for hemorrhages; and emollient applications to the eyelids where the conjunctivæ are painful and swollen. If the eruption be tardy in its appearance, the patient may be immersed in a warm bath, at the same time that tartarized antimony and sudorifics are administered internally. Opiates are contra-indicated in the primary fever, on account of the extreme excitability of the nervous system; in the secondary fever they are frequently highly useful. Sydenham recommended a small bleeding at the commencement of the secondary fever, and following it up with an opiate; but he cautions us against abstracting too much blood. The safer practice is not to bleed, and in this opinion the profession are generally agreed.

These are the remedies which are applicable to small-pox in its ordinary and uncomplicated form; but when the disease assumes any of the unfavourable characters which have been described, other measures are indicated, such as local bleedings, and counter-irritation. Local bleeding by leeches or cupping may be employed at any period of the disease, when the symptoms indicate serious congestion of viscera; the abstraction of blood must, however, be conducted with caution, lest too great debility follow its use. Counter-irritation is applicable when the removal of blood by bleeding would be inadmissible. Under the same circumstances, again, mild purgatives may be administered, when symptoms of gastro-intestinal irritation are absent. But purgatives, it must be recollected, are calculated to excite and keep up irritation of the mucous membrane, and they may frequently be very judiciously superseded by emollient injections. At the close of the eruption, the employment of gentle laxatives is indicated, and if much debility be present, tonics should be had recourse to, and their action aided by wine and nutritious diet. When there is pain and heat of head, with delirium, which depletion from the mucous membrane of the nose and behind the ears has been unsuccessful in removing, ice may be applied to the head, or the cold water pillows recommended by the late Professor Davis for hydrocephalus, or, still better, the cold cushions of Dr. James Arnott.[1]

When the nervous system is especially affected, as in that variety termed by Dr. Gregory nervous variola, the administration of tonics is called for; and similar means must be adopted when there is evidence of a cachectic state of constitution, as in the occurrence of petechiæ, passive hemorrhages, &c. Whatever the treatment adopted, however, these cases are too frequently fatal.

Cold affusion has, at various times, been extolled by eminent practitioners, but the plan has been only sparingly adopted. Some have recommended that it should be conducted in the manner laid down for scarlatina, while others confine themselves to sponging the surface of the body, or the face alone. Cold water does not appear to have the effect of causing retrocession of the pustules, but it is thought to increase the congestion of the mucous membranes. My brother, Dr. Marris Wilson, has pursued the practice of sponging the surface, for several years, and he assures me with the best success.

The belladonna treatment recommended for scarlatina is also applicable to small-pox. I have seen this remedy exhibited with the greatest benefit, both as a prophylactic and a curative measure.

Vaccination has been observed to possess the power of modifying variola, even when an attack of the latter has already commenced. Some remarkable cases are on record in which the good effect of this remedy was apparent. It recommends itself, moreover, by its extreme simplicity of application. Eichhorn, who was the projector of this plan, inserted the vaccine lymph by forty or fifty incisions, immediately that the symptoms of small-pox became apparent.

147. As regards *local* treatment, various plans have been adopted and recommended for the purpose of bringing the pustules to a favourable issue, and of preventing the deep ulcerations, with their consequent cicatrices, which are apt to ensue when the eruption is left to itself. We will now proceed to consider these plans, but, before doing so, it may be necessary to premise that every precaution should be taken to prevent the rupture and laceration of the pustules by the nails of the patient, in efforts made to relieve the itching by which the desiccating process is accompanied. The face should be frequently and well bathed with an infusion of poppies, or mallow, with weak barley water, or a weak solution of common salt, particularly in the region of the eyes, the nose, and the lips. The secre-

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[1] See Lancet, vol. ii., 1841-2, page 441.

tions from these parts should be removed as much as possible by means of a sponge wetted with these fluids, and whenever an excoriation is formed, it should be anointed with a liniment composed of equal parts of olive oil and lime water, or dusted with starch powder.

Great benefit is derived from pursuing the practice of the Arabian physicians—namely, of opening the matured pustules, gently pressing from them their contents, and removing the latter by means of a sponge wetted with plain water, or with an infusion of poppies. This plan accelerates very materially the healing of the ulcerations, and prevents the formation of deep and disfiguring cicatrices.

148. Various ectrotic[1] methods of arresting the development of the eruption of variola, and consequently, of preventing the occurrence of cicatrices, have, from time to time, been suggested and employed. Nitrate of silver has been used for this purpose by MM. Serres, Bretonneau, and Velpeau. If the apex of each conical vesicle be removed, and the pointed extremity of a stick of nitrate of silver be inserted into the opened vesicle, its further progress will be instantly arrested. But this proceeding is necessarily attended with much pain, and requires a considerable period of time for its performance. To obviate these objections, it has been proposed to paint the entire surface with a solution of nitrate of silver, containing fifteen or twenty grains to the ounce. The application of this fluid to a surface of any extent has been found to be dangerous, in consequence of giving rise to a considerable increase of the febrile symptoms, while the anticipated effect of checking the progress of the eruption has only partly succeeded. The solution used in this manner forms a mask to the part upon which it is applied, beneath which the pustules advance unseen and unaltered. The nitrate of silver as an ectrotic remedy is only available, therefore, for the eruption situated upon the face and neck, and to this it must be used quite at the outbreak of the disease—namely, on the first or second day, otherwise it will be liable to failure. In summing briefly the objections to the employment of nitrate of silver, they may be stated as follows:—firstly, it creates pain; secondly, it requires more time for its application than the practitioner can devote; and thirdly, it augments the febrility and nervous exhaustion of the patient.

149. Another ectrotic remedy has been warmly eulogized by Dr. Midivaine,[2] of Ghent. It consists in the application of sulphur ointment by means of slight friction to the entire surface of the skin. This ointment should be composed of two drachms of sulphur to an ounce of lard, and used three times a day, at as early a stage as possible of the disease. The effects of the remedy, according to Dr. Midivaine, are, contraction and hardening of the papulæ, diminution of tumefaction of the skin, and subsidence of the gastro-intestinal irritation. The appetite of the patients quickly returns, and they are speedily restored to health.

150. A more important ectrotic remedy than either of the preceding, is one which has lately been made the subject of an essay,[3]

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[1] Εκτιτρωσκειν, to render abortive.

[2] Bulletin de la Soc. Med. de Grand, 1840.

[3] Lancet, vol. i., 1840-41, p. 674.

read before the Parisian Medical Society, by their president, Dr. Oliffe. This remedy is mercury, applied to the external surface of the body, and is one which is deserving our most attentive consideration. Mercury administered internally has long been known to possess remarkable powers in modifying the influence of variola upon the system, but it was left to modern times to prove that this agent has also the property of neutralizing the variolous virus when applied externally. I pass over the well-known and unmeaning experiment of Von Wenzel —namely, the trituration of the variolous matter with calomel, and the subsequent marvel that the virus should have lost its inoculating power, to the more rational experiments of Serres, afterwards so successfully pursued by M. Briquet. The mercury was employed by these gentlemen in the form of a plaster, the emplastrum vigo cum mercurio, of which the formula in the French pharmacopœia is as follows:—

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Mercury	95 parts.
Balsam of storax	48
Common plaster	312
Wax, resin, turpentine, ana	16
Gum ammoniac, bdellium, olibanum, and myrrh, ana	5
Saffron	3
Spirit of lavender	2

M.

In the first experiment, a strip of this plaster was placed on the arm of a patient attacked with variola, while a similar strip of diachylon plaster was applied to the opposite arm. Under the mercurial plaster the development of the eruption was arrested, under the other plaster no modification took place. In a second case, the face of the patient was "covered with the plaster, a part of which he tore off during the night which followed its application. The denuded surface was the seat of suppurating pustules, whilst on that portion of the visage which continued subjacent to the plaster, their abortion was effected." In a third case—a man affected with "violent confluent variola, the pimples were small, scarcely raised above the level of the epiderma, and surrounded with a brilliant red areola. The vigo plaster was applied, and allowed to remain seven days; on its removal, it was found that no suppuration had been established, with the exception of four pustules, and these were situated near the mouth, and had not been in contact with the plaster. This patient was radically and rapidly cured, and no scars were manifested."

The mode of application of the mercurial ectrotic is thus stated by Dr. Oliffe:—"The whole face should be covered with a mask of the vigo plaster, merely leaving a space for the mouth, nostrils, and eyes. A little mercurial ointment is applied to the eyelids." "The plaster is allowed to remain for three days in simple small-pox, and for four in confluent." In the event of any objection to the plaster arising, mercurial ointment may be substituted with a fair prospect of benefit. I recently suggested this plan of treatment to a young practitioner who had several cases of small-pox under his care; he reported to me, that within half an hour of applying the unguentum hydrargyri fortius to the skin, the troublesome itching entirely ceased, and the pustules ceased to grow. M. Serres entertained the belief that the mercurial treatment would effect the miscarriage of the eruption, at whatever period it was used; but M. Briquet has satisfactorily shown that the eruption remains unmodified, if it have reached its pustular stage. The proper period for the application of the remedy is the second day, or, at the latest, the third day of the eruption. Its effect is to produce immediate resolution of the eruption, or to arrest it at the papular or vesicular stage; it never becomes purulent, and the skin between the pustules is never inflamed and swollen. But, however powerless as a perfect ectrotic the mercurial application may be when used in the pustular stage, it would seem from the evidence of Dr. Oliffe, that the local inflammation is much modified and ameliorated. According to M. Briquet, "the mercury acts as an antiphlogistic, or resolutive, in destroying or suppressing the local inflammatory process; or it exercises a specific action on the cause, whatever it be, which produces the variolous pustule." From the researches of M. Briquet on other inflammations of the skin, the latter of these propositions would appear to be the most correct.

It is interesting to learn that, in the progress of his experiments, M. Briquet ascertained that mercury possessed precisely the same influence over vaccinia as over variola—an additional fact in evidence of the identity of these diseases.

The mercurial ectrotic treatment has been adopted with success by Dr. Hughes Bennett, in Edinburgh. He employed an ointment consisting of the unguentum hydrargyri fortius, an ounce mixed with one drachm of starch powder. The ointment was applied pretty thickly over the face night and morning, with the result of preventing itching and swelling of the skin, the deep red stains which small-pox commonly leaves behind it, and the formation of pits.

I have not heard of any injurious effects following the use of the mercurial ectrotic, but M. Piorry has recommended in its stead the application of blisters. The advantages of his method he conceives to be the avoidance of any risk of salivation, and of the danger of repulsion. The blister, he remarks, is derivative in its action, and not repellent; but he, at the same time, admits the possibility of ischuria as a consequence of its use.

I cannot recognise for a moment the doctrine of repulsion, or the theory upon which it is based in connexion with the arrest of the serious effects of small-pox upon the face: the only part of M. Piorry's objection which merits attention is the chance of exciting salivation, which is known to be an occasional normal accompaniment of the variolous fever. If this fear should sway the mind of any of my readers, and if salivation, on the one hand, and ischuria, on the other, should seem to them to prohibit the use of both remedies, there is another against which neither objection holds; although I believe it to be inferior in power to the mercurial ectrotic. I allude to the tincture of iodine. This fluid is to be pencilled on the eruption, at as early a stage as possible, once or twice a day. Dr. Crawford of Montreal first called attention to the remedy, in 1844, and gave a favourable report of its success; and his report has been corroborated by the subsequent practice of other medical men in British America and the United States. Its good effects are the alleviation of inflammation, pain, swelling, and itching, the arrest of development of the pustules, the prevention of the red stains which follow the eruption, and the considerable reduction in extent of the pitting of the skin. In this latter respect, the tincture of iodine is decidedly inferior to the mercurial ectrotic.

The impermeability, tenuity, transparency, and simplicity of application of collodion, have given it a place among the substances which, acting upon the property of excluding air, have been employed as ectrotic remedies. It possesses the advantages of extreme cleanliness, and of enabling the operator to see what is passing beneath, without requiring to disturb it. Another of its properties—namely, its contractility, must also be considered as an agent in its beneficial effect, since, by means of the peculiar pressure which it exerts upon the skin, it will disperse the congestion of that tissue. Being incapable of producing ptyalism, it is free from any objection of that kind. It has been made the subject of experiment in France, and favourably reported on by Dr. Aran, of the hospital Bon Secours.[1]

151. An impression subsisted among the ancient physicians, that the light of the apartment in which small-pox patients are kept, should be either modified or excluded. In pursuance of this view, and at the suggestion of John of Gaddesden, the rooms were hung with scarlet cloth, and the windows carefully blocked up. So recently as 1832, Dr. Picton,[2] of New Orleans, asserts, that in his practice no instance of pitting after small-pox occurred when the light was shut out. M. Serres placed a glass capsule over a small-pox pustule, and observed the effects produced by excluding the air and light. He found that, in proportion to the exclusion of both was the development of the pustule checked, and that when they were completely shut out, the pustule became shrivelled and quickly dried up. Moreover, M. Serres remarks, that he never reaped such successful results, in the cure of small-pox, as he did at La Pitié, during one year that the patients were placed in a kind of cellar, which was very dark, and ill-ventilated. The same principle has been more recently acted on by M. Legrand, who proposed to the Academy of Medicine, in 1839, the plan of covering the surface of the body with gold leaf. After the experiments of M. Fourcault (§ 81,) this practice would appear somewhat hazardous.

VARICELLA.

Syn. *Modified Small-pox. Varioloid. Spurious Small-pox. Variolæ pusillæ; verrucosæ; crystallinæ. Variola lymphatica. Verole volante*, Fran.—*Unachten Kindpocken*, Germ.

152. During the prevalence of an epidemic of small-pox, the variolous contagion develops itself in a variety of forms, some of which are remarkable for their severity, and others for their exceeding mild-

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[1] Bulletin de Thèrapeutique, vol. xxxix., p. 369.

[2] American Journal of Medical Science.

ness. A medium state between these two extremes has been denominated benignant small-pox. Upon closer investigation, it is perceived that benignant small-pox, and all the most serious varieties of this disease, are characterized by the appearance of eruption pursuing a given course within a given space of time, and presenting a regular succession of alterations. On the other hand, it is likewise perceived that there are several forms of eruption resulting from the same variolous contagion, which are deficient in the characters needful for their consideration with the preceding group. They are much milder in their local, and, for the most part, in their constitutional nature, and their course is limited to a shorter period. It is to this second group that the term varicella (modified small-pox) properly applies, and under this head I shall proceed to describe the different varieties which small-pox, in its modified form, is capable of assuming.

153. Variola, it has just been observed, occasionally appears in its varicellar form without any obvious cause, the modification probably depending upon some present state of constitution of the individual. Thus, it not unfrequently happens that a single member of a family may be affected by varicella, while several others of the same family have true variola. But the individual so affected with varicella in this instance may, during a future epidemic, be attacked with genuine small-pox. At other times, and these are the most frequent, the eruption is modified by that state of constitution which succeeds to vaccination, inoculation, or a sporadic attack of small-pox. Hence, after the preparation of the system by either of these affections, the contagion of variola gives rise generally to varicella, and but rarely to the genuine small-pox. If other proof were needed of the close relation subsisting between variola and varicella, it would be found in the fact that the latter is infectious and contagious, and is capable of communicating true variola to a sound person.

154. Varicella, in this point of view, may be regarded as an arrest of development of variola, and the forms which it is capable of assuming may consequently be deduced from the observation of the natural course of small-pox. Thus, if the variolous disorder were to expend itself in its first stages, we should have a varicella resembling the papular eruption of small-pox, in other words, a *papular varicella;* if the variolous disorder progress beyond this stage, we shall then have a *vesicular varicella;* and if it proceed still further, a *pustular varicella.* The latter, however, is capable of presenting some modifications; in one of these, the contents of the conical vesicles are simply transformed into a purulent fluid, without any alteration of their form; this constitutes the *conical pustular varicella:* in another, the purulent fluid distends the vesicle to so great an extent, that it presents a globular figure; this is the *globular pustular varicella:* while, in a third, the pustules assume the characteristic features of those of variola, being flattened and umbilicated; this, which is the most advanced grade of varicella, is the *umbilicated pustular varicella.* Moreover, it has been remarked, that in varicella, as in variola, the constitutional affection may be present without the eruption, constituting *varicella sine varicellis.*

It must not be supposed, however, that any one of these forms occurs singly; the distinction is intended merely to apply to the general predominance of one or the other, for each variety is more or less commingled with the rest, and, in some instances, all the forms appear upon the same individual in nearly equal proportion. In describing the varieties of varicella, it will be convenient to reverse the order of relation here laid down; thus, in a tabular plan, these varieties are—

Pustular varicella.
Umbilicated pustular varicella.
Globular pustular varicella.
Conical pustular varicella.

Vesicular varicella. *Papular varicella.*
Varicella sine varicellis.

155. Varicella makes its invasion with symptoms resembling those of small-pox, but much milder in degree. In some instances they scarcely amount to more than mere indisposition, while, on the other hand, they may be severe. The chief of these symptoms are, feverishness, uneasiness at the epigastrium, nausea, vomiting, pains in the loins and in the head, with accelerated pulse. At the end of a few days, usually three or four, the eruption makes its appearance in the form of red points and spots, which resemble those of small-pox. The constitutional symptoms are relieved by the eruption, and gradually decline. The eruption, however, proceeds on its course, advancing, if it be of the pustular kind, quickly through the papular and vesicular, to the pustular stage, arriving at its height by the fourth or fifth day, and then declining without any increase of the constitutional symptoms, and without the secondary or suppurative fever which occurs in small-pox. The pustules speedily dry up, and form thin brownish scabs, which fall in another few days, and leave but a slight and transient pitting of the skin, with a few discoloured red or purplish spots. When, however, the pustules are broken and lacerated by scratching, cicatrices of small size occasionally result. Varicella, in its progress, is accompanied by a broad and patchy areola of a pale red colour, which contracts its boundaries as the pustule advances, and ultimately forms a narrow, brownish circle around its circumference.

The urine in varicella, when the fever is mild, differs very little from the normal state of that secretion. "Schönlein states that in the first stage of this disease the urine is often as limpid as in hysteria." While "in a case of varicella, in which the early symptoms were extremely severe, the urine was passed in very small quantity, of a deep red colour and a specific gravity of 1.022-7."[1]

UMBILICATED PUSTULAR VARICELLA.

Syn. *Varioloid.* *Modified small-pox.* *Varicella cellulosa.* Cross.

156. The precursory symptoms of this variety of modified small-pox usually continue for three or four days, and are succeeded by an

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[1] Simon, Am. ed.

eruption of red spots, which soon become hard and papular in the centre. On the second day of eruption, the papulæ are conical in form, and vesicular at their points. On the third and fourth days, the vesicles increase in size, and become flattened and umbilicated, while their contents lose their transparency, and assume an opaque and whitish hue. During the fifth and sixth days, the suppurative stage is established, but without secondary fever, and the pustules on the face desiccate and form scabs. On the seventh day, desiccation occurs on other parts of the body, and by the eighth, the whole of the pustules are covered with yellowish brown scabs, which, in a few days more, are detached, and fall off. The process of desiccation commences at the centre of the pustule, and proceeds towards the periphery, and the scabs at their fall leave a slight pitting, and red or livid discoloration of the skin, which lasts for a few weeks, but no cicatrices or permanent impressions remain behind.

Umbilicated pustular varicella is generally commingled with the conical and globular forms of the eruption, and also with the papular and vesicular kinds. It sometimes appears in successive eruptions, and in this case it is not uncommon to find on the skin, at the same time, papulæ, conical vesicles, with their thin scabs; and conical, globular, and umbilicated pustules, with their thicker and browner scabs.

VARICELLA GLOBULARIS.

Syn. *Globular varioloid. Hives.*

157. The globular variety of varicella is characterized by the form and large size of the pustules, which surpasses that of all the other varicellæ. At its height, the dome of the pustule is larger than its base, which it consequently overhangs, and the latter is not quite circular in outline. The precursory symptoms of this variety are usually severe. They are succeeded by the eruption of a number of red spots, having in their centre a small, prominent, and globular papula, which speedily increases in size, and becomes vesicular at its extremity. On the second or third day of the eruption, the contents of the vesicles assume an opalescent and pearl-white colour, particularly towards the centre. On the fourth and fifth days, the vesicles go on increasing in size, the contained fluid becomes purulent, and the areola by which their bases are surrounded of a bright red colour. On the sixth, the vesicles attain their greatest bulk, their contents are more purulent, and the areola still further increases in redness. On the seventh and eighth days they begin to diminish, their parietes are flaccid and wrinkled, and desiccation is established. On the ninth day, the desiccation of the pustules is completed on the greater part of the body, and they are converted into brownish, lamellated scabs, which are loosened and thrown off during the two or three succeeding days, leaving behind them some slight impressions, and a temporary congestion of the derma.

Globular varicella is not unfrequently mingled with the pustules of the umbilicated and conical varieties. The ordinary duration of this eruption is ten or twelve days, but if the pustules be developed successively, it may be continued for a few days longer.

VARICELLA CONIFORMIS.

Syn. *Conical varioloid.* *Swine-pox.*

158. The conical variety of varicella is recognised by the form of its pustules; they are developed, like the preceding, after two or three days of constitutional symptoms, upon red spots, which soon become papulated in the centre, and surmounted by whitish and opaque elevations of the epiderma. During the third day, the size of the vesicle is increased, its form has become more distinctly conical, and its base more highly inflamed. During the fourth and fifth day, the vesicles still further augment in bulk, their contents become purulent, and the areola which surrounds them more inflamed. On the sixth day, they are flaccid and wrinkled, and begin to desiccate; and on the seventh are covered by prominent scabs of a yellowish, or yellowish brown colour, which fall in the course of a few days. The pustules of conical varicella are sometimes very numerous, and collected into closely set clusters; they are usually attended by considerable pruritus, and are not unfrequently intermingled with the pustules of the umbilicated variety. The ordinary duration of the eruption of varicella coniformis is eight or ten days, but when it occurs in successive attacks, it may be continued for a few days longer.

When the vesicles are torn and broken in attempts made by the patient to relieve the itching, the spots become inflamed, they ulcerate, and secrete a thick pus, which concretes into scabs of greater thickness than those of the natural pustules. These scabs are of a dark brown, or blackish colour, they remain longer than the thinner scabs of the pustules, and leave cicatrices at their fall. Such accidents occur most frequently upon the face.

VARICELLA VESICULARIS.

Syn. *Varicella lentiformis.* Willan. *Varicella lymphatica.* *Chicken-pox.*

159. Vesicular varicella, or chicken-pox, is preceded by febrile symptoms, which are very mild in the discreet form of the eruption, but severe in the confluent kind. The eruption makes its appearance in the form of small, red, and slightly raised spots, of an oval or irregular form. On the second day, a minute transparent vesicle is developed in the centre of each of these spots. On the third day, the vesicles go on progressively increasing; they are flattened on their summits, and the contained fluid, transparent and limpid at first, becomes yellowish, opaque, and lactescent. On the fourth day, they begin to collapse and shrivel, and on the fifth and sixth, to desiccate into thin, brownish and lamellated scabs, which fall on the eighth or ninth day, leaving behind them a slight congestion of the derma, but no depression. While this course is being pursued by the vesicles which first appear, others are successively developed, so that the eruption may be seen at once in all its stages, and may be prolonged to ten or twelve days, and sometimes to two or three weeks. The eruption of chicken-pox appears first on the back, and thence extends to the rest of the body; it is attended with much itching, and many of the vesicles retain their papular or aborted form: the perfected vesicles are surrounded by an inflamed areola of small extent.

VARICELLA PAPULARIS.

Syn. *Varicella verrucosa. Horn-pox. Variolæ verninosæ; verrucosæ.*

160. This is the most simple, and, at the same time, the least severe form of varicella. After the invasion of febrile symptoms of the mildest kind, an eruption of red spots, followed by papulæ, is developed on the surface of the skin. The papulæ are various in point of size, and hard to the touch, but they offer no disposition to proceed to the evolution of vesicles and pustules. The redness fades in the course of a few days, and the papulæ are gradually lost. The eruption of papular varicella rarely exists alone, it is usually commingled with one or other of the more advanced varieties.

VARICELLA SINE VARICELLIS.

161. Varicellar fever occurs chiefly in those who have been inoculated or vaccinated, or have previously suffered from variola. It is occasionally, though rarely, observed during the prevalence of epidemic variola.

162. *Diagnosis.*—Varicella differs from small-pox in several essential particulars—namely, in the lesser degree of severity of the constitutional symptoms; in the shortness of course of the eruption; in the absence of secondary fever; in the appearance of the eruption at its height; in the minor degree of inflammation surrounding the pustules; in the thinness of its scabs; and in the freedom from permanent impressions and cicatrices.

At the earliest moment of eruption, it is impossible to establish a distinction, since both affections are developed in the form of red spots with central stigmata.

163. *Causes.*—Varicella originates in the variolous contagion, and frequently precedes or follows an epidemic of small-pox. This observation would lead to the inference that, at the commencement, the variolous contagion had not yet gathered sufficient power to excite true small-pox in any but the most susceptible, and that, at the conclusion of the epidemic, the contagion had lost the strength necessary to awaken any but a modified affection. The inference, in truth, is correct, for when in a state of dilution, the variolous contagion is capable of producing only varicella in persons of average susceptibility. In those who possess the susceptibility of infection in a high degree, true variola may be excited; and for the same reason, the contagion of varicella is apt to communicate variola to individuals so constituted. Another condition conducive to the development of varicella is deficient susceptibility. In some instances, this deficiency is the result of constitutional idiosyncrasy; in others, and they are the most usual, it is a consequence of a modification of the system, produced by vaccination, by inoculation, or by a previous attack of variola.

Varicella is infectious and contagious, and transmissible by inoculation. Its contagion may excite either varicella or true small-pox. The result of inoculation is similar; in one instance, varicella may be developed; in another, true variola. The variola communicated by varicella is for the most part mild, but the severity of the affection would appear to depend upon the constitution of the individual, rather than upon the nature of the contagion. Varicella may occur repeatedly in the same person, and it possesses less preservative power against the contagion of small-pox than vaccination.

Vesicular varicella, or chicken-pox, is stated to have occurred as an epidemic, and independently of variola: Dr. Mohl[1] observes, that at Copenhagen the chicken-pox occurred annually between the years 1809-1823, without any association with small-pox. And Dr. Watson remarks, "It must, therefore, I think, be admitted that there is a separate disease called chicken-pox, which springs from a specific poison." Vesicular varicella is less easily transmissible than the other forms. When inoculated, varicella of the same kind is sometimes developed, at other times the pustular form, and again, true small-pox.

164. *Prognosis.*—Varicella is generally a mild disease, and one of favourable termination. Sometimes, however, it issues fatally, and during certain variolous epidemics, is remarkable for the severity of its concomitant symptoms, or for a fatal tendency. The umbilicated pustular varicella is the most serious of its varieties.

165. *Treatment.*—The treatment of varicella is to be conducted on the same principle as that of variola. If there be congestions, they must be combated as they arise; and if the eruption should recede, it must be re-excited by stimulation of the skin. In ordinary cases, the simplest antiphlogistic management is all that is needed.

VARIOLA VACCINA.

Syn. *Variolæ vaccinæ. Vaccinia. Cow-pox. Cow small-pox.*

166. Variola vaccina, the small-pox of cattle, is a contagious inflammation of the skin, prevalent among cattle, and occasionally communicated to man. It is characterized by the development, upon inflamed bases, of multilocular and umbilicated vesicles, which pass by degrees into the pustular form, and terminate in hard, dark-brown scabs, the latter leaving behind them deep and permanent cicatrices. Variola vaccina is accompanied by constitutional symptoms, which are mild during the first stages of the vesicle, but become more severe, and constitute a secondary fever, when the local inflammation arrives at its height, and the suppurative process is about to be established.

167. The existence of a disease identical with small-pox among the inferior animals, is a theorem that might, à priori, be predicted. It is perfectly consistent with our knowledge of the physiological laws, and comparative structure of man and animals. It is a position well established with regard to some other diseases, and there can be no doubt that still further analogies in relation to pathology will be unveiled by future research in that most interesting branch of medical science. The announcement of the discovery of a disease analogous to small-pox, in the cow, in the horse, or in any other animal, at the present day, would occasion little surprise; it is admitted, indeed, as a principle, in the first rudiments of our physiological education; but

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[1] De Varioloidibus et Varicellis.

when this declaration was made in 1796 by the immortal Jenner, it was a bold soar of genius, and too enlightened for the philosophy of his age. It is now, however, well established, that small-pox has for centuries been prevalent among animals in all parts of the world; that it has made its invasion as an epizootic, and, for the most part, in connexion with a similar pestilence among men. Jenner was acquainted with the fact of the occurrence of a disease in the horse, which was communicable to the cow, and capable of engendering in the latter animal an eruption that could not be distinguished from the true vaccinia. This disorder in the horse was, unquestionably, the equine small-pox; it was, however, from the circumstance of its development in a situation where, from the thinness of the skin, eruptive disease in a mild form would most naturally occur—namely, in the heels, confounded with a more common disease of this region, the *grease*. By a wrong inference drawn from this observation—an inference perfectly natural and perfectly excusable in the state of science at that period, an inference which its distinguished author subsequently relinquished—namely, that the variolæ vaccinæ had their origin in the horse,—Jenner created an argument which, for many years, was industriously employed as an objection to the philosophy of his views; with how little injury to the splendour of his discovery, we who live can tell.

168. In the excellent report[1] of the Vaccination Section of the Provincial Medical Association, the committee remark that the ravages of this epizootic are not confined to one region of the earth; that such as it has been seen in the valleys of England; it has likewise been observed upon the mountains of the Andes, on the elevated ranges of the Himalayas, in the plains of Lombardy, in the green pastures of Holland, and on the sunny slopes of Asia. It is interesting, moreover to learn that, in Bengal, the natives apply to this disease the selfsame appellation that they give to the small-pox in the human subject —namely, *bussunt*, *mhata*, or *gotee*. It would be so much out of place, in a work dedicated to practical purposes, to go into the numerous inquiries and arguments that have been raised upon the question of the history and analogies of cow-pox, that I shall content myself with stating the facts which I conceive to be established relative to this disease, and the principal observations by which those facts are supported. The facts to which I allude are—

1. The prevalence at the same period of the cow-pox among cattle and the small-pox among men.
2. The transmission by *contagion* of the small-pox to cattle, and the consequent development of cow-pox in those animals.
3. The transmission by *inoculation* of the small-pox to cattle, and the consequent development of cow-pox in those animals.
4. The transmission by *contagion* of the cow-pox to man, and the consequent development of a pustule similar in character to the vaccine pock of the cow.
5. The transmission by *inoculation* of the cow-pox to man, and the consequent development of a pustule similar in character to the vaccine pock of the cow.

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[1] Transactions of the Provincial Medical Association. Vol. viii., 1840, p. 1.

6. The transmission by *inoculation* of the cow-pox to man, and the consequent development of an eruption similar to, if not identical with, the small-pox.

169. The first of these theorems appeals to history for its proof, and is additionally substantiated by the facts which tend to support the second proposition. Its accuracy has been verified also by several practitioners, during the recent epidemic of small-pox in England. Mr. Gibson,[1] in a sketch of the province of Guzerat, states that variola carries off annually many persons, and "the same disorder is at times very fatal among the cattle." Mr. Macpherson, writing from Murshidabad, in 1836, observes that the disease among the cows has not occurred in that province for two years; that during the same interval very few cases of variola have been known, and from these circumstances he infers "that the unknown causes which favour the disease in the human subject have the same tendency in the cattle; in fact that variola, and mhata, or gotee, owe their origin to the same cause." Mr. Lamb, stationed at Dacca, remarks, in 1836, that during the prevalence of variola, the cow-pox "appeared in one muhalla, and carried off fifteen or twenty cows."

170. The transmission by contagion of the small-pox to cattle, which rests upon the assertion of numerous observers, is strikingly illustrated by Mr. Ceeley,[2] in the following narative:—"On Friday, the twenty-second of October, 1840, my friend Mr. Knight informed me by letter, that he had on that day seen on the hand of a patient, Mr. Pollard, aged fifty-six, who had never had small-pox or vaccine, two broken vaccine vesicles, which the patient said he had caught while milking his own cows, some of which he knew were affected with the same disease, and were then very difficult to milk." Mr. Pollard at the same time expressed his conviction "that his cows had been infected from human small-pox effluvia, to which he considered they had been exposed." It appears that the small-pox had been prevalent in the village of Oakley, and the last three persons attacked were two women and one child. "The two cottages in which these three patients resided during their illness were situated on each side of, and closely connected with, a long, narrow meadow, or close, comprising scarcely two acres. The first-named patient, though thickly covered with pustules, was not confined to her bed after the full development of the eruption, but frequently crossed the meadow, to visit the other patients, the woman and child, the former being in great danger with the confluent and malignant form of the disease. She died on Monday, the seventh of September, and, according to custom, was buried the same evening. The intercourse between the cottages across the close was, of course, continued after this event. On the following day, the wearing apparel of the deceased, the bed-clothes, bedding, &c., of both patients, were exposed for purification on the hedges bounding the close, the chaff of the child's bed was thrown into the ditch, and the flock of the deceased woman's bed was strewed about on the grass within the close, where it was exposed and turned

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[1] Transactions of the Medical and Physical Society of Bombay. Vol. i.

[2] Transactions of the Provincial Medical Association. Vol. x., 1842, p. 211.

every night, and for several hours during the day, until the thirteenth of September—eleven days. On that day, the above-mentioned eight milch cows, and two sturks, were turned into this meadow to graze. They entered it every morning for this purpose, and were driven from it every afternoon, to be transferred to a distant meadow to be watered and milked, where they remained through the night. Whenever the cows quitted the meadow in question in the afternoon, the infected articles above mentioned were again exposed on the hedges, and the flock of the bed spread out on the grass, and repeatedly turned, where it remained till the morning, when the cows were re-admitted. It appears, however, that the removal of the infected articles was not always accomplished so punctually as had been enjoined, for both the proprietor and the milkers affirm, that on one occasion, at least, they observed the bed-flock on the grass, and the cows amidst it, and licking it up. The proprietor positively declares, and the milkers corroborate his statement, "that the animals were in perfect health on their first entering this close, but within twelve or fourteen days of that event, five of the milch cows appeared to have heat and tenderness of the teats, upon which, imbedded in the skin, were distinctly felt small, hard pimples, which daily increased in magnitude and tenderness, and in a week or ten days rose into blisters, and quickly ran into brown and blackish scabs. At the same period, when the teats were thus blistered and swollen, and very tender, the constitutional symptoms were first observed—viz., sudden 'sinking,' or loss of milk, dribbling of saliva from the mouth, and frequent inflation and retraction of the cheeks, starring of the coat, 'tucking up of the limbs,' and 'sticking up' of the back, and rapid loss of flesh: the process of milking was now very difficult, disagreeable, and even dangerous: and on the fourteenth of October, the middle of the third week, the detachment of the crusts and loose cuticle, and the abundant discharge of pus on attempting to milk, compelled the milkers to desist, for the purpose of washing their hands. Soon after this period, the cows became by degrees more and more tranquil, as the tenderness and tumefaction of the teats subsided, and finally, milking was performed with comparative facility, and at the period of our visit, scarcely any trouble arose in the performance of the operation, though here and there a teat seemed still tender." In his remarks upon this case, Mr. Ceeley observes, "Another circumstance, too, requires to be particularly noticed; it is the fact of the occurrence of the vaccine disease on a young sturk, which, of course, could not have been induced by those casualties which commonly propagate it among milch cows, but simply by the cause which originated the disease in the other five animals, whatever that may have been. The sturk is not considered liable to the vaccine, at least so it is inferred in this neighbourhood, because no one has ever seen the animal affected by it."

It is scarcely needful to add more evidence to that contained in the preceding paragraph, in proof of the communicability of the contagion of small-pox from man to cattle, but I cannot forbear quoting one or two further illustrations: the first is contained in the following brief extract from a letter addressed by Dr. Waterhouse of Cambridge, Massachusetts, to the celebrated Jenner:—"At one of our periodical inoculations," says the writer, "which occur in New England once in eight or nine years, several people drove their cows to a hospital near a populous village, in order that their families might have the daily benefit of their milk. These cows were milked by persons in all stages of small-pox; the consequence was, the cows had an eruptive disorder on their teats and udders so like the small-pox pustule, that every one in the hospital, as well as the physician who told me, declared the cows had the small-pox."

Dr. Sonderland, of Bremen, communicated the small-pox contagion to cows, by covering them with sheets between which persons fatally affected with small-pox had lain. These experiments were successful in a few cases, after many trials.

171. The third position—namely, the transmission of small-pox to cattle by means of inoculation, and the consequent development of cow-pox in those animals—is also established on abundant evidence, for the chief of which we are indebted to the zealous perseverance of Mr. Ceeley, of Aylesbury. It is stated by Dr. Macmichael, in an essay read before the College of Physicians, in 1828, that "vaccine matter having failed in Egypt, medical gentlemen were led to institute certain experiments, by which it has been discovered that, by inoculating the cow with small-pox from the human body, fine active vaccine virus is produced." M. Viborg, of Berlin, is reported to have inoculated cattle, and several other classes of domestic animals with success.

Mr. Ceeley instituted a series of experiments on the inoculation of the cow with variolous lymph in the month of February, 1839. In his first subject, no effect was observed for nine days, at the end of which time, one out of seven punctures inoculated with virus of the seventh or eighth day, presented the appearance of a tubercle. On the tenth day, this tubercle had all the characters of the vaccine vesicle; by the fifteenth day the vesicle reached its acmé, and was "truly splendid." Decline commenced on the sixteenth day, the crust was well formed on the seventeenth, but was rubbed off prematurely. In this experiment the vesicle was retarded five days; the usual period of maximum development of the variolo-vaccine pock being the tenth day. In a second experiment, the first inoculation failed. After re-inoculation, four out of the seven punctures looked purplish or livid on the fifth day, and were vesicular, with incipient central crusts on the sixth. By the tenth day they had attained their acmé. On the eleventh, decline had commenced, and progressed gradually, till the twenty-sixth day, when the crusts fell, leaving behind them smooth rose-coloured pits.

172. The fourth proposition is one so well established as to require no especial remark. The nature of the affection resulting from this contagion is considered in the section entitled "Casual variolæ vaccinæ in man." The fifth proposition is equally satisfactory in its proof; the effects of "primary lymph" from the variolæ vaccinæ will be stated at a future page.

173. In support of the fact announced in the sixth proposition, it

has been observed that when the epizootic disease presents characters of great severity, the symptoms produced on man by inoculation from such causes were also severe, and often serious, contrasting strongly with the mild affection engendered by the virus from the ordinary discreet form of cow-pox. Mr. Macpherson, in experiments with this virus in Bengal, in 1837, found that an eruption was developed, which was identical with small-pox. Mr. Wood, of Gowalpara, in 1839, met with similar cases of so great severity, that he was led to contemplate the substitution of inoculation with small-pox virus, as a safer expedient. At Silhet, Mr. Brown removed some dark-coloured scabs from a cow labouring under variolous disease, and triturating them in a mortar, he inoculated several children with the pulp. These cases exhibited nothing remarkable, excepting a somewhat greater degree of constitutional disturbance on the eighth day than usual. After two months, children inoculated from this stock were attacked on the eighth day with severe fever, "followed by an eruption, which spread over the whole body, and, in one case, proved fatal." The eruption so produced bore all the characters of true small-pox. Thus it would appear, that as the small-pox virus, when introduced into the system of the cow, is so modified by the vital laws which regulate the functions of the animal as to produce an eruption of cow-pox; so, on the other hand, the virus of the cow, under like circumstances, is modified by the constitutional phenomena of the human organism, and is made to assume the characters of small-pox.

VARIOLA VACCINA IN THE COW.

174. Variola vaccina in the cow is by no means a common affection, and when it occurs, it is usually met with in milch cows, a circumstance attributable to the transmission of the contagion by the hands of the milkers. Occasionally the disorder appears as an epizootic, but more frequently in the sporadic form. In rare instances it would seem that the source of this contagion has been a variolous eruption developed in the horse, and mistaken for a more common vesicular disease in that animal, the *grease*. The vaccine disorder is modified by a variety of conditions, such as the temperament of the animal, the tone of its tissues, its state of health, the thickness of its skin, and its colour. A slight difference is also observed in the disease, in relation to its origin in a sporadic form, or as the result of contagion communicated by the hands of milkers; the former of these varieties Mr. Ceeley terms *natural*, and the latter, *casual*.

175. *Natural variola vaccina* makes its invasion with heat and tenderness of the teats and udder, unaccompanied by constitutional symptoms; the inflamed surface is irregular and pimply to the touch, and papulæ of a red colour, hard, and as large as a pea, are soon developed. In three or four days from invasion, the papulæ have attained the size of a horse-bean; they are tender and painful, and vesicles are gradually raised upon their summits. The vesicles, increasing in size, become acuminated, ovoid, or globular, and are distended with an amber-tinted and viscid fluid. When ruptured, they present depressed centres, with an elevated and indurated margin,

and when the epiderma is rubbed off, the surface of the corium is of a vivid red colour, with a small central slough. When uninjured, or merely ruptured, without the removal of the epiderma, the vesicles desiccate into thick, dark-brown crusts, which commence in the centre, and proceed towards the circumference, appearing at first enchased in the marginal elevation, and subsequently extending completely over it. The surface from which the epiderma is removed becomes covered by thin, brownish scabs, which are termed *secondary*.

176. *Casual variola vaccina* appears as an eruption on the fifth or sixth day after contagion, in the form of small, tender papulæ, which are developed upon the teats and neighbouring surface of the udder. By the sixth or seventh day, the papulæ have attained the size of a pea; they are reddish in colour, and circular or oval in form. On the summit they become gradually depressed, assume a yellowish-white and pearly hue, and have a small central dot or linear impression. On the eighth or ninth day, the central concavity increases in depth, while the margin becomes more elevated, tense, and shining, more pearly or silvery in its aspect, and the central depression acquires a bluish or slaty tint. At this period, the pock is more than half an inch in diameter, and is surrounded by a narrow areola of a pale rose, or light damask hue. Between the tenth and the eleventh day, the eruption reaches its acme; the elevations are now upwards of three-fourths of an inch in diameter, the areola has increased to four or five lines in breadth, and the integument beneath is tense and indurated. The central depressions have augmented in depth, their bluish, slaty colour has acquired greater intensity, and the epiderma which invests them becomes distended with an abundance of lymph, and rises into a globular or conical vesicle. Many of these vesicles are now ruptured, others remain whole, but, in either case, they shrivel and desiccate into brownish or black crusts, which are first observed in the centre, and increase towards the circumference, until they reach and overlap the marginal border of the pock. The induration and enlargement of the latter diminish, and the crusts are thrown off spontaneously between the twentieth and twenty-third day, leaving a slightly depressed and smooth cicatrix of a pale rose or whitish colour. Such is the usual course of the cow-pock, but it necessarily presents many diversities of appearance, dependent upon aggravation of symptoms, &c. Thus, instead of forming crusts in the manner described, ulcerated and sloughing surfaces are sometimes produced, which remain for weeks in an irritable state. Moreover, casual vaccine variola always presents the eruption in every stage of its progress at the same moment, the elevations with their central depressions are intermingled with incipient papulæ, and while the crusts are being perfected in some, the vesicles are yielding in others to the distention of their lymph. This succession in the eruption depends upon the diffusion of the virus by the rupture of the vesicles, either in consequence of the movements of the animal, or by the milker, and the consequent re-vaccination of the neighbouring unaffected skin. Mr. Ceeley has observed as many as sixty pocks upon the udder and teats of a single cow.

VARIOLA VACCINA IN MAN.

177. Variola vaccina may be communicated to man, either accidentally, or by voluntary inoculation. In the former case, the contagion is received directly from the animal, usually from the cow, but sometimes, as in the case of variola equina, from the horse. It had long been observed, that persons who had suffered from this disease were preserved against the influence of small-pox, and thence originated the practice, introduced by Jenner, of transmitting the contagion artificially to man, by means of inoculation.

178. It is a principle, well established in pathological science, that the animal system, once subjected to the influence of any disease originating in specific contagion, is protected, to a greater or less extent, against subsequent incursions of that disorder. Thus we observe that the modification which the system undergoes in the reception of rubeola and scarlatina, is protective of the individual against that contagion for the rest of life. The same circumstance is remarked with regard to small-pox, and other contagious fevers. When this fact was contemplated by the medical philosopher, in association with the fearful ravages of that dreadful pestilence and scourge of the human race, small-pox, such as it existed in former ages, the expedient suggested itself to his mind, that if the disease could be anticipated, if the disorder, in a mild form, could be communicated to man, life would be spared, and the system equally defended against the subsequent contagion of a more virulent and fatal disease. This design, happy in thought, and happy in application, gave birth to the practice of inoculation for small-pox. Inoculation for small-pox, however, was not free from objection; the disease thus engendered was always serious, often fatal, and frequently became the source of a malignant contagion. In this state of demi-subjugation small-pox was found by Jenner, when the well-known fact of the protective influence of cow-pox first engaged his attention, and aroused in his comprehensive mind the philosophic thought that spread happiness and security where gloomy anticipations and uncertainty had previously existed. He had the talent to perceive, in cow-pox, small-pox in its mildest possible form; and he trusted that the transmission of this to man would ensure the same results as inoculation with the virus of human small-pox. This trust was rewarded by the complete success which attended the prosecution of his views.

179. In the foregoing remarks I have endeavoured to show that the advance of improvement to the Jennerian standard was progressive, and that it was created by the contemplation of the wants of the human race. Since Jenner's discovery, nearly half a century[1] has glided away, half a century, moreover, replete with important and valuable discoveries, both in general and medical science. A portion of that half century has seen the attention of medical practitioners again engaged in considering the imperfections of our present means of defence against small-pox. A third era of discovery has just dawned. It is seen that although, as a general rule,

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[1] Jenner's first experiment was made on the 14th of May, 1796.

the principle announced in the preceding paragraph—namely, that the invasion of the contagious disease is protective against subsequent attacks of the same disease is correct, yet, that exceptions to this rule do occur so frequently, as to indicate the necessity for further investigation into the nature and history of small-pox, with a view to afford additional security against its ravages. Thus it has been observed, that secondary attacks of small-pox are not unusual, and that small-pox after vaccinia very frequently occurs. Instances of the latter kind, indeed, are so often met with as to lead to the belief that vaccinia gradually loses its protective influence over the system.[1]

180. With a view to meet the declining influence of vaccinia, numerous propositions have been made, and modes of practice adopted, the principal of which are, re-vaccination, retro-vaccination, variola-vaccination, and an immediate return to the variolæ vaccinæ of the cow. These various modes of re-establishing the protective powers of vaccinia I shall examine in their turn, after having, in the first place, traced the history of the casual vaccinia, as observed and recorded by Mr. Ceeley, and having described the effects of ordinary vaccination with Jenner's lymph.

CASUAL VARIOLA VACCINA IN MAN.

181. The transmission of the cow-pox contagion to man presents all the anomalies which are known to accompany exposure to other sources of contagion. Milkers who have never been vaccinated will sometimes escape altogether, while others, who have been vaccinated or variolated, will take the disease; and instances not unfrequently occur, in which persons, who regard themselves secure, in consequence of having previously suffered from casual vaccinia, are a second time affected. In all the three latter cases, however, and especially in the last, the disorder is characterized by the manifestation of a much milder type than that of the unmodified disorder. The parts of the body usually affected in milkers are, the backs of the hands, the flexures of the joints and sides of the fingers, and the face. When the eruption appears in the latter situation, the virus is conveyed by means of the hands moistened with the lymph of the ruptured vesicles. On the backs of the hands, and between the fingers, the epiderma is thinner than on the palmar surface, and consequently affords greater facility to its imbibition by the dermal tissues; for it is satisfactorily proven that abrasion of the surface is by no means necessary to the inoculation of the disease. When, however, the epiderma is abraded, and the skin chapped, the effects of the virus are remarkable for severity, subcutaneous abscesses are liable to form, and the lymphatic vessels and glands frequently become inflamed.

182. The signs which indicate that the contagion has taken effect, are the appearance of inflamed spots or papulæ, which are hard to the touch, acuminated, and deep-seated. The papulæ are of a deep rose-red, or purplish colour, and are soon surmounted by an ash-co-

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[1] In a conversation which I recently had with Mr. Marson, he made the important practical observation that, after an imperfect vaccination, re-vaccination will often fail, while the person still remains open to the reception of small-pox.

loured, or livid vesicle, which assumes the umbilicated character as it increases in size, and then becomes yellowish in the centre. At this period the areola makes its appearance, lymph is effused beneath the umbilicated epiderma, and a vesicle of variable size, and of a bluish or slate-coloured aspect, is developed. The local inflammation is sometimes so severe as to produce sloughing of the derma and serious constitutional disturbance.

In illustration of this affection, Mr. Ceeley[1] has recorded the following interesting case:—

"Joseph Brooks, aged seventeen, a fine, healthy, intelligent young man, who had not been the subject previously of variola, or of the vaccine, stated that he commenced milking on Friday, the ninth of October, and that his milking was confined to four cows, only one of which had the disease, from four to six vesicles on each teat. He milked those four cows occasionally, and continued to do so till the eighteenth of the same month, (ten days,) having milked them in that period six times. On this day, (the eighteenth,) he felt the cervical absorbent glands and lymphatics stiff and tender, and on the twentieth, found a pimple on the temporo-frontal region, which he could not resist scratching. On the day before that, he observed on his finger a red pimple, of the size of a pin's head; on the next day, one on the thumb, very small. In neither situation was he aware of the pre-existence of any visible wound or abrasion of the cuticle. On the twenty-first he had head-ache, general uneasiness, and pains in the back and limbs, with tenderness and pain in the course of the corresponding lymphatic vessels and absorbent glands, particularly of the axilla, which increased till the twenty-third, when nausea and vomiting took place. His right eyelids became swollen, and were closed on that day, but after this period he became better, in all respects, never having been confined to the house, although disabled from work. The vesicle on the temporal region had a well-marked central depression with a slight crust, a general glistening appearance, and was of a bright rose or flesh-colour, with a receding areola, and there was an inflamed, tumid, and completely closed state of the corresponding eyelids.

"On the finger the vesicle was small and flat, with a slightly depressed centre, containing a minute crust. It had a beautiful pearly hue, and was seated on a bright, rose-coloured, slightly elevated base. On the thumb the vesicle was also flat and broad, but visibly depressed towards the centre, where there appeared a transverse linear-shaped crust, corresponding doubtless with a fissure in the fold of the cuticle. The vesicle was of a dirty yellowish hue, and visibly raised on an inflamed, circumscribed base; lymph was obtained from a vesicle on the temple, in small quantity, by carefully removing the central crust, and patiently waiting its slow exudation. In this, as in most other respects, it strikingly resembled the vesicle on the cow, and appeared as solid and compact. The lymph was perfectly limpid, and very adhesive. No lymph was taken from the vesicles on the finger and thumb, with a view to avoid any interruption of their natural course.

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[1] *Transactions* of the Provincial Medical Association, vol. x., p. 216.

"On the twenty-sixth and twenty-seventh, when the redness and elevation of the base of the vesicles had materially diminished, the vesicles themselves had become greatly enlarged. On the thumb and finger they were loosely spread out at the circumference, each having a dark and deep central slough. On the temple, the margin of the vesicle, as on the cow, was firm and fleshy, its diameter being nearly ten lines, and its centre filled with a dark brown, firmly adherent slough. In about seven or eight days, by the aid of poultices, the sloughs separated, and the deep ulcers healed, leaving cicatrices, like variola, deep, puckered, and uneven, which were seen on the twenty-fifth of November."

INOCULATED VARIOLA VACCINA.

183. The inoculation of variola vaccina, or, as it is popularly termed, *vaccination*, consists in the transference of a small portion of the contents of the vaccine vesicle, the vaccine lymph, or virus, to the papillary surface, or to the tissues of the derma of a sound person. This object is effected by means of a small puncture, by several punctures, by a number of superficial scratches, with the point of a lancet or needle imbued with the virus; or, as recommended by Mr. Crosse,[1] by means of a small blister. The blister is produced by retaining upon the arm a piece of adhesive plaster, in the centre of which has been placed a fragment of emplastrum lyttæ, not larger than the head of a small pin. When the blister is formed, the lymph is to be deposited on the exposed surface of the derma. Mr. Crosse found this proceeding very successful in the case of a strong child, who resisted the operation in the usual way; and it is worth bearing in mind in cases where the ordinary operation has more than once failed. Another, and rarely practised mode of vaccinating, is to make a small incision, and place within it a thread impregnated with the vaccine lymph. The punctures are made obliquely through the epiderma, in order that the papillary surface may be attained without the effusion of blood, or with the escape of as little as possible. The virus which is in this manner introduced into contact with the derma, is dissolved in the fluids of the tissues, and imbibed into the system, its agency thereon being indicated by certain local and constitutional effects.

184. The local signs indicating that the vaccination has taken effect are first apparent on the third or fourth day after the operation, at which period there is a slight degree of elevation and hardness of the skin (papular stage) at the seat of the puncture, and a trifling blush of redness immediately surrounding it. On the fifth and sixth day, a small quantity of liquor sanguinis is effused beneath the epiderma, and a vesicle is formed, which is whitish and pearly in appearance, of a roundish or oval figure, and umbilicated at its centre. The vesicle goes on increasing in size until the eighth or ninth day, at which period it has become fully distended, and has attained its perfect development. On the ninth day it loses the umbilicated form, it becomes flattened on the surface, and sometimes more convex than at

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[1] Lancet, vol. ii., 1850, p. 642.

the circumference, and is composed of numerous small cells, which are filled with a limpid and transparent lymph.

On the eighth day, (sometimes the ninth,) the perfect vesicle is surrounded by an inflamed areola, of a vivid red colour, (*the pearl upon the rose*,) which gradually increases in extent, from a few lines to more than two inches in diameter. The skin included by this areola is inflamed and tumefied, and is frequently the seat of eruption of a crop of small transparent vesicles. On the tenth day, the redness and heat have increased; there is considerable itching in the part, the movements of the arm are somewhat painful, and the axillary glands are liable to become tender and swollen. It occasionally happens, that at this period an erythematous blush spreads from the arm, over the surface of the body, in irregular patches.

On the eleventh day the areola begins to diminish, the fluid contained within the vesicle has become purulent, and desiccation commences at its centre, and proceeds gradually towards the circumference. During the succeeding days, the areola disappears more and more, the tumefaction subsides, and the vesicle desiccates into a dark brownish crust, of an irregular form. The crust, by a continuance of desiccation, diminishes in size, and assumes a blackish hue. It is detached at the end of seventeen days after vaccination, and leaves upon the skin a depressed cicatrix, at the bottom of which are seen numerous small pits, (foveolæ,) which correspond with the separate cells of which the vesicle was composed. The cicatrix is permanent, enduring for the remainder of life.

To recapitulate: the first two or three days are those of *incubation;* the fourth is *papular;* the fifth, sixth, seventh, and eighth, *vesicular;* the vesicles presenting an *umbilicated* form, and attaining perfection on the last of these days; the eighth day, moreover, is the period of the first phasis of the areola, when the vesicle represents the "true pearl upon the rose;" the ninth, tenth, and eleventh days are *pustular*, the lymph becomes purulent, the umbilicated form is lost, the areola enlarges, and constitutional fever is established; the twelfth, thirteenth, and fourteenth days are those of *desiccation;* the fifteenth, sixteenth, and seventeenth, of *separation*, and these latter are succeeded by the fall of the scab.

Such is the course of the vesicle of vaccinia, which is considered necessary to the protection of the system. When its progress is irregular, and its development not perfectly effected, the constitution remains in the same state in relation to the occurrence of variolous contagion as before the operation. It must be borne in mind, however, that the local affection is never so well marked in the adult as in the child, although the extension of inflammation to the neighbouring glands and the constitutional fever are often greater.

The proper time for the performance of vaccination is infancy, between the third and the seventh month. At an earlier or a later period, the diseases incidental to childhood may interfere with the progress of the case. Jenner pointed out the fact that certain diseases of the skin, particularly those of a vesicular kind, interfered with the proper development of the vesicle, and other influences are derived from age or idiosyncrasy.

185. The constitutional symptoms accompanying vaccination are always slight, and often scarcely perceptible. In some instances, however, a little fever is observed at about the eighth and three following days, this febrile reaction corresponding with the progress of the inflammation of the areola.

SECONDARY ERUPTIONS OF VACCINIA.

Syn. *Vaccinella.*

186. The general effects of vaccination occasionally offer some peculiarities. Thus it sometimes happens, that during the course of the vaccine pock, an eruption of vesicles appears upon the skin. Such an eruption lately fell under my observation, in which vesicles and bullæ[1] were developed upon inflamed patches, on the greater part of the surface of the body. The principal features of this case were the following:—

Green, a child eighteen months old, was vaccinated at the London Small-pox Hospital, on Monday, June 7th, 1841. On the ninth or tenth day after the operation, an eruption of red spots was perceived upon the forehead, which quickly extended to the face, neck, trunk, and arms, and by the thirteenth day were dispersed over the whole of these regions, the redness being augmented towards evening, and during the night. On the sixteenth day I first saw the patient; the vaccine crust and areola were natural, the eruption had subsided on the face, and was now principally confined to the arms, the chest, and back, the legs being nearly free. In these situations it existed in its successive stages; there were small red spots, the earliest form of the affection, and larger patches, of a roundish or irregular form, of about the size of a fourpenny piece, several of these latter patches being congregated here and there, so as to form clusters of considerable size. The margins of the patches were of a dull red colour, and somewhat elevated, while the centres presented a yellowish tinge, and in some situations were covered with numerous small vesicles, containing a limpid and transparent serum. On the eighteenth day, the redness of the patches was declining, their raised border had become lighter in tint than the centre, and the epiderma was desquamating over their surface, particularly on those patches where vesicles had existed. On the face, the vesicles terminated in thin, brownish, and spongy laminæ. I inoculated a healthy child with lymph taken from these vesicles, but without any result.

187. In the early part of the present year I had an opportunity, through the politeness of my friend and neighbour, Dr. John Hall Davis, of seeing an infant in whom the secondary eruption of vaccinia was so severe as to be the cause of death. The eruption commenced upon the head and face, and thence extended to the neck and chest. On the latter there were more than one hundred vesicles, presenting the characteristic flattened and umbilicated form of the vaccine pock. They were for the most part discreet, but every here and there were

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[1] Mr. Ceeley regards this eruption of a pemphigoid character as "strictly a vaccine eruption;" he has seen it frequently on children, and occasionally on the cow and dog.

confluent clusters of three, four, and five. On the neck, the vesicles were confluent; the slight and irregular intervals of skin between the large patches were vividly red, and the whole surface poured out an abundant ichorous discharge. The child had evinced a tendency to eczematous eruption from its birth; a circumstance deserving the attention of the medical practitioner.

The following case occurs in the "Archives de Médecine" for September, 1841. An infant a week old was vaccinated July 3d; on the 10th, several papulæ appeared on various parts of the body. On the 15th, there were eleven umbilicated vesicles on the abdomen and legs, similar to those of vaccinia. Three children inoculated with lymph from this eruption had vesicles developed identical with those of ordinary vaccinia.

188. Dr. George Gregory lately communicated to the Royal Medical and Chirurgical Society, the case of a child in whom petechiæ appeared upon the skin four days after vaccination. The child was to all appearance in perfect health. The areola was occupied on the eighth day by an extensive ecchymosis, and the body was covered by petechial spots. By the sixteenth day, the petechiæ had commenced to fade. Five children of the same family were vaccinated at the same time, and with the same lymph, and went regularly through the disease. Dr. Gregory regarded this case as one of petechial cow-pox, in which the influence of the vaccine virus in the production of a hemorrhagic state of the system was demonstrated. Petechial cow-pox is rare; Dr. Gregory had never before seen a similar case, and had only heard of two of the same kind.

PROTECTIVE POWER OF VACCINATION.

189. I now come to a question of the utmost importance—namely, the efficacy of vaccination as a protection against small-pox. But before I engage in this discussion, it may be necessary to define precisely the meaning which I attach to the term vaccination. Vaccination I conceive to mean,—

1. That the lymph employed in the operation is pure.
2. That it has been obtained from a vesicle which has passed regularly through the course described in the preceding section.
3. That it has been procured from the vaccine vesicle between the sixth and eighth day of its course.
4. That the vesicle produced by this lymph in the vaccinated subject shall have passed regularly through the stages known as the natural course of the vaccine pock, and described in the preceding section, (§ 184.)
5. That at least one of the vesicles produced by vaccination shall have been permitted to remain unbroken and uninjured, until the natural vaccine crust shall have been formed, and shall have fallen in the natural course.
6. That the cicatrix shall be well marked, and permanent; perhaps also foveolated.

When the whole of these conditions are complete, vaccination is perfect, and the person so vaccinated may be regarded as protected against small-pox. But if, on the other hand, any of these conditions be incomplete, it would be monstrous to expect that the full influence of the vaccine protection should be exerted. Again, it has been observed, that the nearer the approach of the condition to the standard above established, the more protective will be the influence effected by the operation, and vice versâ.

190. The purity of the vaccine lymph is a point of the first consequence. The genuine lymph appears to undergo no change or loss of power by indefinite transmission, provided always that due attention have been directed to the fact of its being always obtained at the requisite period, and from a vesicle which has passed regularly through its course, in fact, from the true "pearl upon the rose." But as the attention necessary for the assurance of this condition has unfortunately, in many cases, been omitted, much spurious lymph has been mingled with that derived from the original source, and, as a consequence, small-pox after vaccination has become more frequent, and vaccination has fallen into disrepute. It would, however, be unjust and unphilosophical, to attribute this apparent falling off in the influence of the vaccine lymph to any but its true cause, the one just mentioned.

On this topic, I was much gratified by a recent conversation with Mr. Marson, the resident surgeon and vaccinator of the London Small-Pox Hospital. He informed me that when, in 1835, he became attached to the hospital, he found in use a lymph which had been employed there for nearly forty years, and which had become greatly enfeebled in its powers. Two years afterwards, namely, in March, 1837, he fortunately met by accident with some new lymph, of a very superior kind to his own, and possessing more active properties. That lymph he has continued to use until the present time, and without injury to its powers, although during the intervening period he has vaccinated nearly 50,000 children, and distributed lymph to nearly 25,000 medical men.

191. The period best suited for obtaining the vaccine lymph is the *seventh day* of the vesicle, which corresponds with the eighth day of the operation; Jenner says, between the fifth and eighth day, which is too indefinite.[1] If the vesicle appear incomplete on the seventh day, the removal of lymph might be deferred for a day, but it is important to obtain it before the inflamed areola is formed. After the areola is established, the lymph becomes altered in its character and purulent, and either loses the power of exciting a pock, or produces one which is irregular in its appearance or course, and is incapable of conferring safety on the person vaccinated. It is true, that occasionally the fallen crust is sufficiently impregnated with the desiccated lymph to possess the power of exciting the disease, and is sometimes used as a convenient means of transporting the virus to warm climates; but the crusts for this purpose must be selected with care, and even then are liable to failure.

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[1] Mr. Marson requires the vaccinated children to be brought back to him on the day-week of their vaccination; consequently on the completion of the seventh day and dawn of the eighth; the lymph is therefore seventh-day lymph. On this day he generally finds the lymph fit for removal.

192. That the vaccine pock shall pass regularly through its course, is the most important of all the conditions requisite for the success of vaccination. Jenner especially pointed out the necessity of this rule, for he perceived that its neglect might lead to the most serious results. That neglect has, I fear, very extensively existed, and many of the distressing consequences under which we now suffer are referrible to it. The fulfilment of this condition is in itself the best assurance of the purity of the lymph, of the disposition of the system to receive its influence, and of the completion of the subsequent conditions.[1]

193. When the vesicle passes regularly through its stages, the cicatrix which it leaves behind is strikingly characteristic, and may be depended upon as a proof of successful vaccination. But the absence of the foveolated appearance of the cicatrix is no proof that the preservative influence of vaccination has not been established, provided that a permanent cicatrix of the ordinary size be present. But when there is difficulty in discovering the cicatrix, or the latter is small, it may unhesitatingly be concluded that the pock did not complete its necessary stages, and, consequently, that the person is still unprotected.

VACCINATION TESTS.

194. With the view to ascertain whether vaccination has been effective, several plans have been adopted which are termed tests. The most efficient of these is inoculating with small-pox after vaccination; re-vaccination is a second test; and a third is that described by Dr. Bryce of Edinburgh. Bryce's test consists in re-vaccinating a few days after the first vaccination. In this case, if the constitution be already affected by the vaccine influence, the second pock hurries through its stages, and speedily reaches an equal development with the first, arriving at its acme at the same time, and desiccating and forming its crust contemporaneously with its predecessor.

RE-ESTABLISHMENT OF THE PROTECTIVE INFLUENCE OF VACCINIA.

195. For several years past, opinion has been divided relative to the protective influence of vaccination against small-pox. By some it is believed, that the power of vaccination as a defence against variola diminishes gradually with the advance of age; and by others, it is thought that the vaccine virus introduced by Jenner has degenerated during the forty-six years that it has been transmitted through the human race, and lost a portion of its protective quality. I shall not stop to inquire into the merits of these two questions, both warmly contested and supported by powerful advocates, but at once proceed to examine the propositions that have been made and acted upon for the purpose of supplying a remedy against the evil consequences which they would imply. As a means of perpetuating the vaccine influ-

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[1] It may not be out of place here to remind the vaccinator of the importance of being very particular with regard to the purity of the instrument used in performing the operation, and indeed of the necessity for nicety and care throughout the entire process. I was lately called upon to give my opinion in the Coroner's Court, upon a case of death which had resulted from vaccination. Another child, vaccinated at the same time, had narrowly escaped the effects of inflammation of the absorbents and suppuration of glands; and there was every reason to fear that these dreadful consequences resulted from an impure lancet.

ence, two modes of procedure have been recommended—namely, re-vaccination, and variolation after vaccination. And with the view to meet the second evil, three plans have been adopted—namely, retro-vaccination, variolo-vaccination, and recurrence to the primary lymph from the cow.

RE-VACCINATION.

196. The phenomena of contagion, as it affects the human frame, develop two important facts: *firstly*, that the workings of contagion in the animal organism destroy the susceptibility of that organism to take on a similar action; *secondly*, that, from the moment of completion of the workings of contagion, the organism becomes gradually and slowly restored to the condition which it possessed previously to the development of contagion. In the abstract, these positions are incontrovertible, but they require the modification implied in the estimate of time, to render them applicable to the thousand peculiarities that occur in daily practice. Thus, in relation to the first, we have to inquire,—For what length of time the susceptibility is destroyed? and in relation to the second,—At what period after contagion is the restoration of the organism so far effected, that a second attack of contagious disease may take place? To both of these questions the answer is—*We know not.* All that we can venture to affirm with regard to them is, that, in one individual, a single attack of contagious disease appears to be protective of the individual for life; while, in another individual, a second attack may occur in a short period, the precise limits of that period not being correctly established. The determination of the shortest period at which contagious disease may resume its influence over the system is a point of much importance, and one of legitimate investigation. It is in the field of numerical medicine alone that we must look for a solution of the questions which are now proposed.

The reasoning, which is here directed to contagion in general, applies with particular force to the protective influence of the contagion of small-pox. A single attack of small-pox would appear, in the majority of cases, to protect the individual for the rest of life, but in a smaller number of instances, the variolous constitution is still active, and a second, a third, and even more attacks may be experienced. Now, that which is true with regard to variola, is equally true with regard to vaccinia; for variola and vaccinia are, in their essential nature, one and the same disease.[1] Again, it is admitted at all hands, that severity in the manifestation of the variolous disease affords no security to the system greater than that to be derived from the mildest form; and as vaccinia is variola in the mildest shape in which it can be presented to the human organism, the question of re-vaccination resolves itself into the propositions stated above.

If we admit that vaccination, although perfectly protective of the constitution against the recurrence of the small-pox contagion, for an unknown and probably variable space of time, ultimately loses its powers; and if, in the next place, we inquire what means present themselves of perpetuating its protective influence, the most natural and rational method that suggests itself to our mind is re-vaccination. Re-vaccination, or a repetition of vaccination, is a simple and harmless operation, producing a mild and trifling indisposition when the system is unprotected, but no effect whatsoever when the organism is safe. Here, then, we find the operation to be acting as a test of the safety of the individual, and no objection can possibly be raised against its use. If the organism be safe, it produces no effects; if the organism be unsafe, it produces a trifling inconvenience, but it leaves a bulwark of safety in its train.

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[1] It is proper to mention, in this place, that many opinions are opposed to this belief. Dr. Robert Williams observes—"Vaccinia is a disease *sui generis*," and further on, he remarks—"It is likewise by no means proved, that the small-pox and the cow-pox are identically diseases of the same species."—Vol. ii., p. 49. Elements of Medicine.

The only question that remains to be considered in relation to re-vaccination, bears reference to the periods at which the operation should be performed. This is a matter of trivial import in comparison with the principle which it involves. I would say, let vaccination be performed every five years, or every seven years, or every ten years. But as our object is protection, let us not defer that protection too long. If the operation succeed at the end of five years, that fact affords the strongest proof that the repetition is not too frequent. If it fail at the end of five years, let it be practised at seven; if it fail at seven, make a third attempt at ten; if the operation fail then, it may be used at successive intervals, but the person inoculated has the satisfaction of knowing himself safe, at a most insignificant inconvenience.

197. Numerous cases have been adduced in which an attack of small-pox has followed vaccination.[1] I care not to inquire if vaccina-

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[1] It must not be imagined that Jenner ever contemplated an infallible remedy in vaccination; he merely expressed his belief that vaccination would be found to protect the organism in an equal, if not in a greater degree, than variola, and with a prodigious saving of suffering and danger. In respect of this expectation, Dr. Robert Williams remarks, that it "has not altogether been verified, the evidence at present accumulated showing the attack of the latter (secondary small-pox) to be only in the ratio of a half to one per cent., while the attacks of the former (small-pox after vaccination) are not less than five per cent., or from five to ten times greater. It is enough of glory, however, to the discoverer of vaccination, and of honest pride to the profession who have adopted it, to be able to state, that by the discontinuance of the practice of inoculation, the total number of persons attacked by natural small-pox in this country, taking the most unfavourable calculations, is reduced one-half, or probably from 260,000 annually, to about 130,000 annually, while the number of deaths have been reduced in a still greater ratio, or from 60,000 to about 11,000; also, that the accidents incident to the disease, as blindness, deafness, lameness, and the endless catalogue of miseries that follow it, are also reduced almost to nothing. This result is that of England and Wales generally, and it is still capable of being very greatly reduced, for among the better protected class of persons, as the army, only one soldier has been attacked by small-pox in every two thousand annually; so that, taking the army at 100,000 men, the mortality is only four from small-pox in the whole of that large force annually. The navy appears also to experience a similar immunity, for out of a mean strength of 7958 seamen, seven only died in seven years of small-pox in the Mediterranean and Peninsular commands, while, in the West Indian and North and South American commands, none whatever. On the Continent, also, where the governments are awakened to the great truth that the health and industry of the lower orders form the surest basis of national wealth and greatness, and where vaccination is consequently made of national importance in the matter of legislation, we find that the mortality from small-pox, though greater than in our army, is infinitely less than in England and Wales generally. In Prussia, for example, according to the table given by Hoffman, on an average of a million of deaths, only 8191 were caused by small-pox, or one in 122. In England and Wales, however, out of 141,607 death, 5811 were occasioned by small pox, or one in twenty-five, nearly; thus showing that the country which gave birth to vaccination suffers six times more by small-pox than that of its wiser ad more considerate neighbour."—(p. 49.)

tion have been perfect in those cases, for instances are equally numerous in which small-pox has followed inoculation, and small-pox itself, both discreet and confluent. These facts prove nothing unfavourable to the claims of vaccination as a protective agent against small-pox; they prove only that which daily experience tends constantly to corroborate—namely, that MAN HAS STILL MUCH TO LEARN. There can be no question that instances of variolous constitution exist, in which all preventive means that we can suggest would be utterly futile, but these are, happily, exceptional cases. We are, I fear, completely ignorant of the laws which govern contagious disorders. It has been observed that rubeola and scarlatina, like variola, occur but once in the lifetime; persons having once suffered from these diseases consider themselves secure from infection, and yet how frequently we have occasion to see the rule nullified, and secondary attacks developed. The following table, quoted from Dr. Heim, in the Report of the Vaccination Section of the Provincial Medical Association, is exceedingly interesting, as showing the relative frequency of success in vaccinating after small-pox, and after vacccination.

Vaccinated after small-pox with success	32
" " modified	26
" " without effect	42
	100
Re-vaccinated with success	34
" " modified	25
" " without effect	41
	100

Re-vaccination is at present being performed very extensively on the continent, which would seem to imply distrust in the powers of the primary vaccination. The results of these operations, however, are calculated to increase our knowledge upon this important subject.

The following are the conclusions of the Commission of vaccine, on vaccination performed in France, during the year 1839.

1. That the simultaneous vaccination of the mass instantly arrests the progress of the variolous epidemic.

2. That if vaccinia be not an absolute and infallible preservative against variola, it is at least the most certain, and the most exempt from danger.

3. That varioloid, in the majority of cases, is the only inconvenience to which the vaccinated are exposed.

4. That there seems no reason for the belief that the long vaccinated are not as surely preserved at the present day as they have hitherto been; nor that the recently vaccinated have received less security than those who preceded them.

5. That the complete success of re-vaccination affords no proof that the individual had ceased to be protected by vaccination, and that he had again become susceptible of variola.

6. That a second vaccination does not appear to possess the power, any more than the first, of protecting all persons indiscriminately from the risk of a future attack of variola.

7. That government ought not to command a general re-vaccination.

8. That the total extinction of variola is to be effected by the universal adoption of vaccination.

VARIOLATION AFTER VACCINATION.

198. Inoculation after vaccination has been proposed as an additional security against the contagion of small-pox. To those who regard vaccinia and variola as different diseases, such a suggestion is likely to be received with approbation, but if we view these disorders in their true light—namely, as one and the same affection, inoculation after vaccination is but a repetition of re-vaccination, and is, consequently, incapable of bestowing any superior advantage.

RETRO-VACCINATION.

199. This operation is attended with some difficulty, in consequence of the indisposition evinced by the assimilative powers of one group of animals to the reception of virus derived from a different order. The operation has, however, succeeded several times in the hands of Mr. Ceeley, and its results are conclusive. This gentleman observed a slight increase in the frequency of the pulse of the animal as soon as the inoculation had taken effect, and the local affection was attended with a moderate degree of inflammation. The vesicles were produced late, and good lymph was procured on the tenth day.

200. When children were vaccinated with this retro-vaccine lymph, the development of the pock was found to be retarded, the papular stage was not established until the sixth or seventh day, the areola was complete on the tenth or twelfth day, and declined during the two following days. The vesicles, in some instances, were smaller or less firm than usual. With these exceptions no difference could be detected between the retro-vaccine and the ordinary current lymph, and these differences were entirely lost after three removes in the human subject. From these experiments, I think it may justly be inferred, that for the purpose of improving the vaccine lymph, retro-vaccination, or passing it again through the cow, is useless.

VARIOLO-VACCINATION.

201. Inoculation with the variola-vaccine lymph is attended with the same difficulties of transmission as are common in the case of unassimilated virus. Out of twenty punctures inoculated with lymph derived from the variolo-vaccine vesicle, Mr. Ceeley obtained only six vesicles. These, when they appeared, were characterized by their early inflammation, and by tardiness and irregularity in progress and development. The secondary fever which arose and subsided with the areola was severe, and if the vesicle were ruptured, ulceration and sloughing were liable to ensue. The effects of this lymph are illustrated in the following successful case:—"Emma Jaycock, aged fourteen, dark, swarthy complexion, thin skin, rather florid; two points of sixth day lymph, and four of eighth day lymph, were inserted into six punctures; on the fifth day, four of the papulæ had ash-coloured

summits, and seemed vesicular, two were doubtful. On the seventh day, there were five small, distinct, reddish-gray, or ash-coloured vesicles, one very small. On the eighth day, the vesicles were advancing, of unequal size, and of irregular form. Here I was forcibly struck with the strong resemblance some of these vesicles bore to those of the eighth day, depicted in Jenner's work, on the arm of Hannah Excell, which he thought so remarkably like the results of small-pox inoculation. My patient stated that she felt slightly indisposed on the fifth and sixth days, that the axilla was painful on the seventh day, and that she was then giddy and sick, but felt worse on this the eighth day. On the ninth day, the areola commenced, and she complained only of head-ache. On the eleventh day it was fully developed, when all her symptoms returned in an aggravated form. On the twelfth day it declined; but the turgid vesicles having burst the flimsy cuticle, renewed inflammation and induration, with circumscribed sloughing and ulceration of the skin, ensued, and rather deep scars are now visible."

After narrating the results of several successive removes of the variolo-vaccine lymph, Mr. Ceeley remarks, "Nothing could be more satisfactory or gratifying than the progress now made, which it would be needless further to detail; I shall therefore abstain from the description of individual cases, after adducing one example from the fourteenth remove, as a type of what might be produced in similar subjects—namely, an infant fourteen months old, florid, plump, and healthy, with a fine, clear, thick, smooth skin.

"In the majority of instances, in propagating from arm to arm, distinct papulation was apparent on the second day; on the third it was not only visible, but elevated and well-defined; on the fifth and sixth, vesiculation was abundantly obvious, and lymph was often taken on those days. On the seventh day, vaccination was frequently performed, and points were often charged; on the eighth, the vesicle commonly exhibited a bold, firm, and glistening aspect; between this period and the ninth day the areola generally commenced, (but in young infants, with tense and sanguine skins, it appeared early on the eighth;) by the tenth day, the vesicle was commonly in its greatest beauty and highest brilliancy, glistening with the lustre of silver or pearl, having the translucency and appearance of crystal, or shining with a pale blue tint, occasionally of a dull white, or cream colour, bold and elevated, with a narrow centre and a broad margin, or flat and broad in the centre, with an acute margin, occasionally not raised above the level of the skin; on this and the eleventh day, an extended and generally vivid areola existed, with more or less tension and induration of the integuments. At this time the lymph was frequently pellucid, and often perfectly efficient. From the eleventh to the thirteenth day, gradually increasing in many individuals, both children and adults, sometimes the entire vesicle, at other times only the central parts, reflected a blue or slate-coloured lymph from the congested or ecchymosed subjacent adventitious structures, proportioned to the texture and degree of translucency yielded by its desiccating epidermis. On the thirteenth and fourteenth day, particularly on clear skins, moderately thick, the vesicles attained a considerable size, measuring often in their longest diameter six and a half, or seven lines, and acquired a light brown centre from commencing desiccation, which was surrounded with an outer margin of dull white, or pale, dirty yellow, soft and flaccid, and still possessing fluid contents. During this period, the areola, of a dull red or damask hue, would revive, and decline again and again, and even to the sixteenth or eighteenth day, the period to which complete desiccation was frequently protracted. The crust commonly partook of the form of the vesicle; it was often prominent and bold, varying in colour from that of a chestnut to that of a tamarind stone. It fell generally about the twenty-third or twenty fifth day, often later."

"The cicatrices were of variable depth and extent. When the vesicles remained unbroken on a thick, sanguine skin, they were deep, but on a thin skin, shallow; they were not always proportioned in width to that of the vesicle, the smallest cicatrix often succeeding the largest vesicle, but the later the crust fell, of course the deeper the cicatrix, which, on these occasions, was often beautifully striated. I need scarcely say, that where the vesicles were accidentally broken, or spontaneously burst, much mischief ensued, deep sloughing of the skin, &c. Spontaneous bursting did not often occur, except in those subjects possessing the before-mentioned and well-known obnoxious constitutional endermic characteristics, upon whom we must always use active lymph with some risk.

"When the lymph in the first remove produced normal vesicles, and as soon as it had passed readily from arm to arm, the constitutional symptoms, though mild, were most commonly well marked. In infants, restlessness, fretfulness, and inappetency about the fifth or sixth day, were very common, sometimes as late as the seventh day. Very few escaped feverish symptoms on the ninth and tenth days; many had vomiting and diarrhœa. From childhood up to puberty, the primary symptoms from the fifth to the seventh day were unequivocally visible, and often complained of; fever, vomiting, delirium, and diarrhœa were not unfrequently witnessed at the commencement, or during the progress of the secondary symptoms. In adults, of course, more complaint was made, head-ache, chilliness, anorexia, and sometimes thirst, on the fifth or sixth day; increased on the seventh day, with axillary tenderness; but on the ninth and tenth days much general febrile complaint, disinclination, and even inability to leave the bed. But, in several instances, amongst young children, little or no complaint was made or indicated; all the members of the same family vaccinated from the same source might be differently affected. One, for instance, would not cease from pastime, occupation, or meals, while another, particularly if older, would be indisposed several days. Neither the number nor the magnitude of the vesicles seemed to determine the amount of the primary disturbance. If properly developed, small vesicles often gave rise to marked constitutional symptoms, and the most splendid vesicles were often seen with trivial, sometimes scarcely appreciable disturbance."

"The secondary symptoms are often as active with three or four, as with six or eight vesicles; acceleration of the pulse was frequently noticed, when no other symptoms appeared. Both primary and secondary symptoms very commonly showed a remitting type."

With respect to cutaneous eruptions, Mr. Ceeley observed but one in the adult, and in children nothing, approaching the varioloid character. "Roseola, strophulus, lichen, were the principal eruptions."

202. Dr. Basile Thiele,[1] of Kasan, has succeeded several times in inoculating the udder of cows. When children were inoculated with matter taken from these pocks, the effects produced were more intense than those occasioned by the ordinary vaccine lymph. In some cases, Dr. Thiele observed two febrile attacks, the one between the third and the fourth day, the other between the eleventh and the fourteenth, and these severe consequences were not lost until the sixth remove. In one case he produced true variola, and inoculation with the matter of these pocks gave him vaccinia.

RECURRENCE TO THE PRIMARY VACCINE VESICLE.

203. Lymph has been procured directly from the cow in several counties of England, and numerous children have been inoculated with this primary lymph; indeed, the removes from these sources have now come into almost general use. The gentlemen to whom we are principally indebted for this supply, are Mr. Estlin of Gloucestershire; Mr. Fox, and Mr. Sweeting of Dorsetshire; and Mr. Ceeley of Buckinghamshire. It has also been obtained and employed in France by M. Saunoy.

204. Whenever an attempt is made to inoculate man with the virus derived directly from the cow, or, on the other hand, to inoculate the cow with humanized vaccine lymph, or with small-pox, great difficulty is encountered. There would seem to exist an indisposition to the assimilation of virus derived from an animal of a different order, but when this lymph has once become assimilated, all difficulty is at an end. When inoculation is effected, a remarkable difference is perceived in the consequences of the two kinds of lymph; thus, in the transference of the lymph of small-pox to the cow, the virus is greatly modified, and the resulting pock is chastened and mild; while on the contrary, the lymph of the variolæ vaccinæ first introduced into the tissues of man, gives rise to symptoms of greater severity than those produced by humanized lymph. How far this difference of effect may be dependent upon the different quality of the fluids of an herbivorous and a carnivorous (the human infant) or semi-carnivorous animal, I am unprepared to say. I think it not improbable that the cause might be found in this difference of character.

The effects of vaccination with primary lymph are, according to Mr. Ceeley, as follow:—On the second day after vaccination there is an unusual degree of redness around the puncture; the redness declines on the two following days, and becomes concentrated in the point where the papula arises. The elevation of the papula commences on any one of the days between the sixth and the tenth. Desiccation of the vesicle is also protracted; it contains fluid until the sixteenth or eighteenth day, and the crust remains adherent until the end of the fourth or fifth week. The areola is completed from the eleventh to the sixteenth day, and is sometimes covered with small supernumerary vesicles, and accompanied by a general eruption of papulæ, vesicles, or bullæ. When the vesicle is ruptured in unfavourable constitutions, irritable sloughing sores are sometimes formed, and the fall of the crust is occasionally succeeded by a yellow, foul excoriation.

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[1] Bulletin de l'Académie Roy, de Méd., Jan. 1841.

The vesicles produced by primary lymph are very variable in appearance; sometimes they are "remarkably large, and finely developed," at other times they are smaller, and "less developed than other vesicles;" but they "admit of a very remarkable improvement, by transmission of the lymph through a series of well-selected subjects. By this process, also, in a very short time, most of the defects and some of the evils connected with the use of primary lymph may be dissipated, and the lymph rendered milder, and more suited to general purposes." "Children are the best, certainly, for the purpose, and such should be selected as possess a thick, smooth, clear skin, and have a dark complexion, and are not too florid, but still plump, active, and healthy." "By a steady and judicious selection of these, and similar subjects, in a few (even three or four) removes, the severity of the local mischief becomes manifestly materially diminished, the vesicles acquire a magnitude and beauty, often greatly superior to what is daily witnessed; and in a short time the lymph may be transferred with safety to others, even more sanguine and robust, where, it is well known, lymph, if good for any thing, will produce the finest and most perfect vesicles." "As we advance, we find the necessity of preparing the most objectionable subjects, and the advantage of subjecting many of them to the same preliminary treatment, which the best and most expert inoculators of small-pox formerly so successfully adopted for their patients; for it is a long time before some individuals can be safely vaccinated with this active lymph, even though taken from the mildest vesicle."

205. Recurrence to the primary lymph from the cow appears to me to be the only unobjectionable method of improving the current lymph, and correcting the deterioration which has arisen from neglect of the precepts of Jenner. Lymph from this source must necessarily be pure, and its use should therefore be encouraged.[1]

206. *Treatment.*—Any morbid conditions arising accidentally from vaccination should be treated in accordance with the general principles of therapeutics. Febrile symptoms may call for the employment of antiphlogistic remedies; and the local inflammation, when it assumes a form of unusual severity, may be subdued by means of a compress of linen wetted in a spirituous lotion and covered with oiled silk. If sloughing or ulceration occur, water-dressing should be continued until the inflammation is removed, and slightly astringent washes or a mild ointment applied subsequently.

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[1] Dr. Lichtenstein, in a paper entitled "On the sources from which matter preservative against the small-pox has been derived," in Hufeland's Journal for 1811, remarks that limpid lymph taken from the pustules produced by tartarised antimony, and inocu-

CHAPTER III.

CONGESTIVE INFLAMMATION OF THE DERMA.

II. INFLAMMATION OF THE DERMA WITHOUT CONSTITUTIONAL SYMPTOMS OF A SPECIFIC KIND.

207. The diseases assembled under this head have their general characters sufficiently marked by the definition which is here given: they are,—

Erysipelas,
Urticaria,
Roseola,
Erythema.

Erysipelas serves to establish a link of transition between eruptive fevers and the second group of cutaneous exanthemata. In some of its characters—namely, in that of transmission by infection and contagion, and in the presence of fever, which precedes and accompanies the local affection, it possesses a close affinity with the former; while in the frequent development of the disease, without the apparent concurrence of infectious and contagious causes, the absence of protection afforded the system against subsequent attacks, the frequent appearance of the disease without precursory fever, and the partial affection of the skin, it approaches nearer to the latter.

Urticaria seems to deserve a place next to erysipelas, from combining considerable severity of constitutional symptoms with a local eruption. Roseola holds a middle position between urticaria and erythema; while erythema forms a transition to the patches of cutaneous congestion on which the bullæ of the succeeding group are developed.

ERYSIPELAS.

Syn. *Febris Erysipelatosa.* Sydenham. *Rosa. Ignis Sacer. Ignis Sancti Anthonii. Erysipele,* Fran.—*Rothlauf,* Germ.

208. Erysipelas[1] is a diffused inflammation of the skin and subcutaneous areolar tissue, affecting a part of the surface of the body, and accompanied by fever which is contagious and infectious. The local

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lated in a person who has not been vaccinated, produces vesicles which cannot be distinguished from those of vaccinia. These vesicles appear to be equally protective against small-pox with the cow-pox, and the matter may be transmitted from person to person in the same manner. The author of the paper has inoculated and re-inoculated thirty-one persons with the matter procured from this source; and these persons were protected during an epidemic of small-pox, although placed in association with patients affected with that disease.

[1] Der. ἐρυθρος, red.

inflammation has a special disposition to spread; it is attended by swelling, a pungent, burning, and tingling heat, and by a redness which disappears under pressure with the finger, to return so soon as the pressure is remitted. It is often accompanied by vesications containing a limpid, amber-coloured serum, which quickly burst, and form thin, dark-coloured crusts. Erysipelas terminates generally in resolution with desquamation of the epiderma, sometimes in delitescence or suppuration, and more rarely in mortification.

209. Erysipelas admits of division into two principal varieties, erysipelas simplex, and erysipelas phlegmonodes. The former of these contains several subvarieties, and some local forms deserving of attention from the modifications which they present, these modifications being a consequence of the peculiarities of the region in which they are developed. Erysipelas phlegmonodes offers but one subvariety of importance. The varieties and subvarieties of erysipelas may be thus arranged:—

ERYSIPELAS SIMPLEX.

Subvarieties.

Erysipelas erraticum,
" metastaticum,
" miliare,
" phlyctenodes,
" œdematodes.

Local Subvarieties.

Erysipelas faciei,
" capitis,
" mammæ,
" umbilicale.

ERYSIPELAS PHLEGMONODES.

Subvariety.

Erysipelas gangrenosum.

ERYSIPELAS SIMPLEX.

210. The inflammation of erysipelas always extends more or less deeply into the tegumentary textures. That which affects the skin the most superficially is the form at present under consideration, which would seem to be limited to the derma and its immediately contiguous areolar tissue. Simple erysipelas occurs most frequently upon the face and head, next in frequency upon the limbs, and most rarely on the trunk of the body. Like other cutaneous diseases, it offers for inquiry, in the first place, its general or constitutional, and in the second, its local symptoms.

The *constitutional symptoms* of idiopathic erysipelas are chilliness and rigors, succeeded by flushes of heat; dejection of spirits, lassitude, pains in the back and limbs, pains in the head, drowsiness; quick and hard pulse; thirst, loss of appetite, white and coated tongue, bitterness of mouth, nausea, vomiting, pain at the epigastrium, and constipation. These symptoms precede the local disorder for several days, increasing with the progress of the efflorescence, and disappearing at its decline. During the height of the local inflammation, the affection of the nervous system often becomes exceedingly severe; there is low, muttering delirium, with subsultus tendinum, an exceedingly rapid pulse, and a brown and dry tongue.

At the close of the fever, there is commonly a critical relaxation of the bowels, a sediment in the urine, and occasionally a slight hemorrhage from some part of the gastro-pulmonary mucous membrane, or from the uterus.

Simon observes that in the early stage of erysipelas the urine puts on the inflammatory character. "It is frequently," Schönlein remarks, "loaded with bile pigment, and is of a reddish-brown or red colour. At the urinary crisis, fawn-coloured precipitates are deposited, and the urine becomes clear." "Becquerel made two quantitative analyses of the urine of a man, thirty-nine years of age, who had erysipelas of the face and a good deal of fever, his pulse being 112. The urine of the first analysis was of a deep yellowish-red colour, and clear; its specific gravity was 1·021. That of the second was so deeply coloured as to appear almost black; it threw down a reddish sediment of uric acid, and had a specific gravity of 1·023. The first analysis was made on the fourth, and the second on the sixth, day of the fever. The analyses are as follow; Becquerel's analysis of healthy urine being placed for comparison in a third column:—

	Anal. 1.	Anal. 2.	Health.
Ounces of urine in 24 hours	27·0	30·8	45·0
Water	965·5	961·9	972·0
Solid constituents	34·5	38·1	28·0
Urea	12·5	12·7	12·1
Uric acid	1·2	1·3	0·4
Fixed salts	—	8·2	6·9
Extractive matter	—	15·9	8·6
Specific gravity	1021·0	1023·1	1017·0

"In a woman, aged forty-five years, with erysipelas of the face, whose pulse was 104 and full, the urine was very scanty, of a dark brown colour, strongly acid, threw down a yellow sediment spontaneously, and had a specific gravity of 1023·1. It contained—

Water	961·7
Solid constituents	38·3
Urea	11·7
Uric acid	1·3
Fixed salts	9·2
Extractive matters	15·7

"In five cases in which the morning urine was daily examined with care, the characters of inflammation were present in a very high degree; the specific gravity varied from 1021 to 1025. In four of these cases the urine threw down a reddish sediment, and in two a little albumen was occasionally present."[1]

The *local* affection makes its appearance on the second or third day from the commencement of the febrile symptoms, and is frequently accompanied by soreness of throat and congestion of the fauces. On the skin, it appears as a somewhat swollen and irregularly circumscribed yellowish-red patch, which is accompanied by a painful sensation of tension, and by a sharp, burning and tingling, or pricking heat. On the third and fourth days, the redness becomes more vivid, the tumefaction greater, and the painful sensations more acute. These symptoms continue without change until the sixth or seventh day, when they begin to decline. The redness then subsides, fading into a pale yellowish tint; the swelling diminishes, the epiderma is thrown into wrinkles, is dry and friable, and speedily desquamates in thin transparent scales. The resolution of erysipelas is the most favourable termination of the disease.

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[1] Simon's Animal Chemistry, American Edition.

Subvarieties.

211. *Erysipelas erraticum.*—Erysipelas is remarkably and characteristically disposed to wander from the spot where it was first developed, to extend itself more diffusely, and to fix upon new situations. Sometimes we find it simply spreading, and thus increasing the extent of the inflamed surface; at other times, it subsides entirely upon the parts first affected, as it proceeds in its erratic course, or it suddenly quits its original situation to appear as suddenly upon one more distant. This erratic or ambulant disposition of erysipelas is often seen upon the face and head, where it is exceedingly intractable.

212. *Erysipelas metastaticum.*—This designation indicates a variety of erysipelas in which the efflorescence suddenly disappears on the surface of the body, and some internal organ becomes immediately and severely affected. The metastatic form of the disease occurs most commonly in debilitated and broken constitutions, and is particularly observable with regard to erysipelas of the head and face. The organs most liable to suffer from the metastatic action in erysipelas are the brain or its membranes, and the gastro-pulmonary mucous membrane. Metastasis to the membranes of the brain is accompanied by delirium and coma, and usually terminates fatally. Dr. Watson remarks that the metastasis of erysipelas is rare. "I do not recollect to have seen it. But the extension of the inflammation, the supervention of delirium and coma, while the external inflammation continues, is of common occurrence."

213. *Erysipelas miliare.*—It occasionally happens that a crop of small vesicles (e. vesiculosum,) like those of eczema, make their appearance on the inflamed surface. They contain a limpid, serous fluid, burst in the course of a day or two from their eruption, and leave behind them small, brownish-coloured scabs.

214. *Erysipelas phlyctenodes* is a common form of the disease; it is that in which vesicles (bullæ, e. bullosum) of considerable size, and irregular in their form, appear upon the inflamed skin. They usually arise on the fourth or fifth day, burst in the course of twenty-four hours from their development, and terminate by forming yellowish scabs, which gradually become brown, and afterwards black. The bullæ contain a limpid serum, at first colourless, but changing by degrees to a pale straw or amber tint. Occasionally the fluid becomes opaque, and sometimes assumes a purplish hue; the latter is an unfavourable sign.

215. *Erysipelas œdematodes.*—In persons of a lymphatic temperament, and in constitutions debilitated by previous disease or excesses,

there exists a disposition to the effusion of a serous fluid into the tissue of the derma, and into the sub-dermal textures, constituting œdema. In this form of erysipelas the inflamed surface is less brightly red than in the preceding varieties, the surface is smooth, tense, and shining, and a pale depression or pit is left upon the skin by the pressure of the finger. Erysipelas œdematodes occurs most frequently in the lower extremities and external organs of generation, and terminates like the simple form of the disease, the effused fluid being removed by subsequent absorption.

Local subvarieties.

216. *Erysipelas of the face.*—The face is the most frequent seat of erysipelas. It commences usually on the side of the nose, and spreads rapidly over the whole of one side of the face, extending sometimes to both. The face is so much swollen by the attack that the features are scarcely recognisable. The cheeks are greatly tumefied, and the eyelids turgid and infiltrated. The constitutional symptoms accompanying the local disorder are exceedingly severe; there is violent head-ache, sleeplessness, frightful dreams, and, commonly, delirium. The disease reaches its height on the fourth or fifth day, and terminates on the seventh or eighth. It is frequently accompanied by inflammation of the mucous membrane of the nose and mouth, by a swollen and painful state of the parotid glands, and its resolution is occasionally indicated by a critical hemorrhage from the pituitary membrane. Erysipelas of the face is always serious, from the great liability to the occurrence of metastasis or extension to the brain, and it is frequently succeeded by subcutaneous abscesses and diffused suppuration: the latter sequela is most commonly met with in the neck.

When erysipelas of the head and face terminates fatally, death is usually occasioned by effusion within the head, and coma. Another cause of death is apnœa, from infiltration of the sub-mucous tissue of the glottis; and a third, asthenia, or a total prostration of the vital powers.[1]

217. *Erysipelas of the scalp* is usually the consequence of a wound or injury to the head, and occurs in about a week or ten days from the reception of the violence. The affected integument is œdematous, smooth, and shining, and very sensitive; but the redness is more dull than in other situations. When left to itself, erysipelas in this region issues in suppuration and gangrene of the areolar and fibrous tissue of the scalp. It often terminates by metastasis, or rather by extension to the brain.

218. *Erysipelas of the mammæ.*—From the quantity of areolar substance surrounding the mammary gland, erysipelas in this region is disposed to take on the phlegmonous character, and to terminate in extensive suppuration, and gangrene of the fibrous substance. The redness accompanying the exanthem is by no means vivid.

219. *Erysipelas in the umbilical region* occurs in infants (erysipelas neonatorum,) particularly in public institutions, and is referrible to irritation produced by mismanagement of the umbilical cord, or, with

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[1] Dr. Watson—Lectures.

more likelihood, to some endemic cause. From the umbilicus, the erysipelas extends to the integument of the abdomen, and frequently to the organs of generation. It sometimes gives rise to sphacelus of the integument and subcutaneous areolar tissue, and terminates fatally.

ERYSIPELAS PHLEGMONODES.

220. Phlegmonous erysipelas is much more severe in its nature than the simple varieties, and affects the deeper seated textures, the subcutaneous areolar tissue, the superficial and deep fasciæ, and the intermuscular areolar tissue, as well as the integument. It may occur on any part of the body, but is most frequently observed in the extremities. This form of erysipelas terminates rarely in resolution, commonly in extensive suppuration, and gangrene of the areolar tissue and fasciæ.

The *constitutional symptoms* are identical with those which accompany simple erysipelas, but more severe, the violence of the symptoms being in great measure dependent upon the extent and depth of the inflammation. When the disease spreads widely and deeply, there is delirium, a dry and brown tongue, frequently diarrhœa, and copious perspirations.

The *local symptoms*, when the inflammation is comparatively superficial, are, vivid redness, which disappears on pressure and returns slowly on its remission, tumefaction, a smooth, shining surface, and an acute, burning pain, augmented by the slightest touch. On the fifth or sixth day, if active treatment have not been adopted, the pain diminishes and assumes a throbbing character, the redness subsides, and an obscure fluctuation may be felt over the surface. Suppuration has now taken place more or less extensively, and the pus burrows beneath the skin and fasciæ in all directions, unless released by incision or ulceration. If an incision be made, it gives exit to healthy pus, mingled with small portions of dead areolar tissue. When the inflammation is disposed to terminate in resolution, the redness, pain, and swelling, diminish on the fifth or sixth day, the epiderma becomes dry and scaly, and the effused fluids are gradually removed.

221. If phlegmonous erysipelas attack more deeply-seated textures, or an entire member, the inflammation appears suddenly, the pain is more severe and distressing than in the preceding form, and the surface is vividly red, tense, and shining, and exquisitely sensitive. On the fifth or sixth day, and sometimes earlier, suppuration takes place, accompanied by throbbing, and preceded by occasional chills and rigors. The redness and pain diminish on the occurrence of suppuration, and an obscure fluctuation and boggy sensation are felt on the application of the hand. If the parts be opened at this period by a free incision, a large quantity of pus will escape, mingled with considerable flakes of areolar tissue in a state of gangrene. Should the incision be neglected, the pus spreads completely around the limb, burrowing beneath the fasciæ, between the muscles, and separating the integument from the parts beneath. Eventually, the matter discharges itself by means of ulceration, but the constitutional irritation is excessive; hectic fever is induced, accompanied by colliquative diarrhœa, and the scene quickly closes in death.

222. When the pus is bound down by aponeurosis, or fasciæ, the constitutional effects are still more intense than those above described. The integument, in a few days, becomes livid and dark-coloured, large vesicles or phlyctenæ, containing a purplish serum, rise upon the surface, gangrene ensues, attended with entire prostration of the physical powers, and death speedily follows. In some cases, however, when the strength of constitution of the patient enables him to resist the effects of sphacelus, sloughs are formed, which are thrown off, and a granulating surface is slowly established. The issue of phlegmonous erysipelas in mortification constitutes the subvariety termed *gangrenous erysipelas*.

223. *Diagnosis.*—The principal diagnostic characters of erysipelas are, inflammation of the skin, extending more or less deeply into the subcutaneous areolar tissue; tumefaction of the inflamed parts; a special disposition to spread; and symptoms of a dangerous fever. These signs serve to distinguish it from erythema, in which the inflammation is superficial, being limited to the derma; there is scarcely any tumefaction of the inflamed parts; the disposition to spread is comparatively absent; and there is little constitutional disturbance. Erythema læve may, at first sight, appear to be a contradiction to these characters, but the œdema in this affection is the cause, and not the effect, as in erysipelas.

The uniform redness of the inflamed surface, and its partial seat, sufficiently distinguish erysipelas from other exanthematous fevers. A few instances have been recorded, in which erysipelas is stated to have been universal, but such cases must be extremely rare.

Simple erysipelas is distinguished from erysipelas phlegmonodes by the tumefaction of the latter extending more deeply, by the greater severity both of the local and constitutional symptoms, and by the violence of the inflammation expending itself upon the part first attacked, without spreading to distant regions.

224. *Causes.*—Erysipelas appears to originate in infection or contagion, hence it is sometimes seen prevailing epidemically, or running through the wards of a hospital. Puerperal fever has also been shown to be a source of the contagion of erysipelas, and the evidence on this head seems to place beyond question the fact, that these two diseases are reciprocally transmissible.[1] The predisposing causes of erysipelas are, some inherent peculiarity of the constitution, as in cases where it occurs hereditarily; or some morbid state of the system. It not unfrequently appears in those whose nervous system is debilitated by mental emotions of a depressing kind, as anger and grief; by chronic disease; or by excesses. Under these conditions, the most trifling irritation may give rise to the affection; such as a scratch with a pin, a leech-bite, a blister, seton, or issue, &c. In like manner, a wound, either accidental, or occasioned by a surgical operation, may be the exciting cause of erysipelas. Persons with a thin and irritable skin, and members of the female sex, are especially liable to erysipelas. It makes its attacks most frequently in the summer season, and

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[1] See an excellent paper on this subject in Dr. Ranking's "Abstract of the Medical Sciences," (vol. iv. 1846,) from the pen of the editor.

is sometimes dependent on functional derangement, such as amenorrhœa, the critical period, &c. In delicate females it occasionally takes place periodically.

225. *Prognosis.*—The prognosis of erysipelas depends upon the various circumstances enumerated among the causes. When the fever is moderate, the constitution sound, and the local inflammation not extensive, the disease may be regarded as of little consequence. When, however, the constitution is debilitated, the invasion of erysipelas is to be apprehended, not only from the deficient power of the system, but also from the liability which exists to inflammation of the superficial veins and lymphatics, and purulent deposits in the viscera. The prognosis is also unfavourable when it occurs either in the very young or in the very old; when it is associated with a wound; when it is complicated with vomiting, or vomiting and purging; or when it succeeds to anasarca. The metastatic form is always dangerous, from the possibility of some vital organ being secondarily attacked. Erysipelas erraticum, occurring in the progress of chronic disease, is also of dangerous import. Phlegmonous erysipelas, on account of its severity, is always dangerous, and requires the most vigilant care.

226. *Treatment.*—The management of erysipelas presents two indications—*firstly*, to subdue the fever; and *secondly*, the local inflammation.

The first of these indications is to be effected by means of rest, an invalid diet, neither too low nor too stimulating; a brisk calomel purge aided by an active dose of sulphate of magnesia and senna, or rhubarb and magnesia, to clear out the digestive canal; subsequently diaphoretics; and if there be much irritability and restlessness, opium; and when the violence of the febrile symptoms has abated, or the vital powers flag, diffusive stimulants, wine, and tonics. Few constitutions will bear the abstraction of blood; and it must be remembered that erysipelas rapidly exhausts the powers of life, is asthenic in its character, and speedily makes a demand for stimulant remedies. An active purgative at the outset of the complaint, once or twice repeated, will, besides performing the necessary office of emptying the alimentary canal and biliary ducts, reduce the vascular system as much as the constitution will bear. We may then follow it up with the liquor ammoniæ acetatis, and sesquicarbonate of ammonia; or the latter in effervescence with lemon-juice; and once or twice in the day a dose of Dover's powder. As soon as the first violence of the febrile symptoms is abated, the diet may be improved. Wine may be added, and tonics of bark or quinine with the mineral acids exhibited.

Dr. Robert Williams, whose observations on erysipelas entitle his opinion to the highest respect, remarks:—"The mode, then, in which I am in the habit of treating idiopathic erysipelas, whatever may be the part affected, or with whatever symptoms it may be accompanied, is as follows:—The patient is put on a milk diet, the bowels gently opened, and from four to six ounces of port wine, together with sago, allowed daily. This mode of treatment it is seldom necessary to vary throughout the whole course of the disease; for the delirium, if present, is generally tranquillized; if absent, prevented; the tongue more rarely becomes brown, or only continues so for a few hours; while the local disease seldom passes into suppuration or gangrene. In a word, all the symptoms are mitigated, and the course of the disease shortened. I have pursued this system for several years, and I hardly remember a case in which it has not been successful."[1]

Dr. Williams records several remarkable instances of the advantages of this method of treatment. He does not limit the quantity of wine to that above stated, but in more severe cases, when the local disease still continues to extend, and the delirium to augment, he increases the wine to eight ounces, and adds to it the influence of quinine. "Two cases of erysipelas," continues the author, "not less instructive, were recently treated in St. Thomas's. The patients were both stout, healthy young women, and nearly of the same age; the seat of the disease also was the same, on the head and face, and they suffered equally from delirium, so that the difference between them, if any, was scarcely distinguishable. For the one, four ounces of wine were prescribed on the Saturday, and there appeared no sufficient reason to increase the quantity on the Monday; but between Monday and Thursday, the day on which I next saw her, she had so sank, that it was impossible to recover her. The other case was admitted about three days later, and, in the first instance, only four ounces of wine were prescribed for her, but warned by the fate of the former person, although she was highly delirious, I immediately increased the wine to eight ounces, and added also two grains of quinine every six hours. Under this treatment she rapidly recovered, so much so, that in four or five days it was thought practicable to reduce the wine to its original quantity, or to four ounces. But on this reduction being made, the disease immediately returned, and it was once more necessary to raise it to eight ounces, and the patient now rapidly recovered." As a commentary on the treatment advocated by Dr. Williams, I may mention, that the worst case of erysipelas of the head and face I ever saw, was cured by the exhibition of Burton ale.

Mr. Grantham, of Crayford, in Kent, a successful practitioner and original thinker, suggests the propriety of making early observation of the state of the urine. "I begin," he observes, "with large doses of carbonate of ammonia, spirits of ammonia, and camphor mixture, as an alkaline mode of treatment, which is generally indicated in the early stage of the inflammation, but towards the sequel of the disease a contrary mode of treatment is necessary, namely, small doses of sulphate of magnesia, with full doses of the acidum sulphuricum aromaticum. The diet should be liquid and nutritive with a full proportion of common salt; and narcotics should be avoided unless indicated by an alkaline state of the urine." It must be remembered that Mr. Grantham's field of observation is a healthful neighbourhood, remote from the causes of depression which exist in towns and cities. In the latter, sedatives form as essential a part of the treatment as stimulants.

By some practitioners, an emetic has been strongly recommended in the outset of the fever, and followed up during its progress by small doses of tartarized antimony. The excitability which accompanies the fever is to be calmed by sedatives, such as hyoscyamus and morphia, as circumstances may suggest, the latter remedy being frequently necessary at night, and in the more advanced stages of the disease. Two very valuable and important medicines in erysipelas are aconite and belladonna; both of these remedies act by reducing the excitement of the arterial system, and procuring rest. The extract of aconite is especially useful in checking the heart's action, and promoting cutaneous transpiration, and for this purpose should be administered in half-grain doses every four hours. Mr. Liston remarks, that after the aconite has performed its office, the extract of belladonna, in doses of one-sixteenth of a grain, is productive of the most beneficial effects.

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[1] Page 284.

In erysipelas about the head and face, the feet and legs of the patient should be immersed in a mustard bath, and mustard poultices or blisters applied to the calves of the legs.

227. The second indication—namely, that which relates to local treatment, is to be fulfilled, in milder cases, by rest, position, evaporating lotions, sedative lotions, warm fomentations, or water-dressings, the temperature of the applications being determined by the feelings of the patient. A lotion which I have found of much service in allaying the uneasiness of feeling attendant on erysipelas, is one composed of a drachm of sesquicarbonate of ammonia, the same quantity of diacetate of lead, and half an ounce of laudanum to a pint of distilled water. But inunction with lard is in every way superior to all fluid applications. My friend, Mr. Grantham, to whom I am indebted for the first suggestion of lard, remarks with regard to its use:—"My plan is to relax the skin with hot water or steam fomentations, and, after each fomentation to saturate the inflamed surface with hot lard, which is afterwards covered with wool." If there be soreness of throat from congestion of the fauces, it should be touched with nitrate of silver.

On the head and face fomentations and fluid applications are generally inconvenient, and their place may be usefully supplied by inunction with lard, or by flour dusted copiously on the surface from the dredging-box. In more severe cases, the congestion of the vessels of the skin is best relieved by puncturing the surface very freely with the point of a lancet, and afterwards using warm sedative lotions and fomentations of chamomile and hops.

This practice was followed by Sir Richard Dobson for many years, and always with the most favourable results. He observes, that the punctures heal in the course of a few hours, that he makes them on every part of the body, and that he never saw any ill consequences result. Sir Richard Dobson was in the habit of making from ten to fifty punctures, about a quarter of an inch in depth, on the inflamed surface, and repeating the operation two or three times a day, as the case appeared to demand. Mr. Liston advocates the same plan. For some time I have pursued this method in the local treatment of erysipelas, and always with the most gratifying effects. It is surprising how quickly the tension and pain are diminished, and the tumefaction reduced.

The relief afforded to the inflamed surface by inunction and puncture, must be referred to two principles altogether different from each other; the one being, so to speak, endosmotic, the other exosmotic. But a substance which has been recently employed as an application to the skin, is known to possess both of these properties in conjunction, and among the numerous experiments which have been made of its virtues, has been found to be a valuable topical agent in erysipelas, compressing the surface, and so relieving tension and pain, constituting an impermeable varnish, and so preventing cutaneous oxygenization of the blood, and the development of caloric which results from that chemical combination. As the purpose of the collodion is to form an impermeable covering, it should be applied with a brush over the entire of the inflamed surface, and repeated daily.

Great benefit is sometimes derived from the application of a strong solution of nitrate of silver to the inflamed surface. Mr. Higginbottom, of Nottingham, by whom this mode of treatment is recommended, gives the following statement of his plan:—"The part is first to be washed in soap-and-water, to remove any oily substance from the skin, and then is to be wiped dry; the inflamed and surrounding skin is next to be moistened, and a long stick of the nitrate of silver is to be passed over the moistened surface, taking care that not only every part of the inflamed skin should be touched, but the surrounding healthy skin, to the extent of an inch or more beyond it, in severe cases. The nitrate of silver may then be passed over these surfaces once, twice, thrice, or more times, according to the degree of inflammation; once in slight cases, twice or three times, in common cases, and more frequently if quick vesication be required." During the last eleven or twelve years Mr. Higginbottom has found a solution of eight scruples of nitrate of silver with twelve drops of nitric acid in an ounce of water, more convenient than the solid salt. He regulates the application of the solution according to the degree of severity of the local inflammation, and prefers a dossil of lint tied on the end of a piece of stick, to a camel's hair pencil for its diffusion over the surface. "The success of the nitrate of silver in external inflammation depends upon its strength and its proper application. The method of applying it by some practitioners appears to me to be quite trifling with the remedy. Instead of covering the whole inflamed surface and the surrounding healthy skin with the nitrate of silver, so as to cover the whole of the inflammation, they simply apply it around the inflamed surface, a mode of proceeding which has seldom the power of even preventing the spreading of the disease or the deeper mischief when the inflammation itself is unarrested. Sometimes, even after the most decided application of the nitrate of silver, the inflammation may spread, but it is then generally much feebler in character, and easily checked by the repeated application of the remedy." "I consider the application of the nitrate of silver as perfectly safe. I have seen no case of metastasis or any other bad effects from the use of it during upwards of twenty years."[1] Mr. Higginbottom further recommends that where erysipelas extends to the scalp, the head should be shaved, in order that the extent of the disease may be fully ascertained, and that the solution may have a fair chance of completely covering it. It should be applied very freely on the scalp, where, he informs me, "it scarcely ever produces vesication."

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[1] Lancet, vol. ii. 1843, p. 515.

M. Jobert[1] has used, with great success, an ointment composed of nitrate of silver and lard, in the proportion of from two to four drachms of the salt to an ounce. This is applied night and morning to the inflamed skin, and for a small space beyond it, and a thin layer is left on the surface.

The nitrate of silver is an excellent means of limiting the extension of the disease, by encircling the inflamed part by a line drawn with a wetted stick of nitrate of silver. When an extremity is attacked, the defensive cordon must extend completely around the limb, above the affected part, and if this simple manœuvre be properly performed, the inflammation will, in many cases, be limited to the part first attacked. Nitrate of silver appears to act by exciting an effusion of lymph and adhesive inflammation in the line of its application, which opposes an obstacle to the propagation of the exanthema: upon the same principle, a narrow or linear blister has been used to form the circle, but whether it possess any superiority over the nitrate of silver is very doubtful. The erratic form of erysipelas may frequently be fixed to the spot originally affected, by the application of a blister; and this is the practice usually resorted to for the purpose of recalling the disease, where it has suddenly disappeared by metastasis. In erysipelas phlyctenodes the vesicles should be opened, and the contained fluid gently pressed out and absorbed by a soft sponge. The epiderma of the phlyctenæ should be preserved as entire as possible, and replaced upon the denuded derma. This manner of treating the vesicles of erysipelas is infinitely superior to the ancient plan of covering them with starch powder, zinc powder, &c. Œdematous erysipelas is especially benefited by the punctures above recommended, followed, as soon as the inflammation is subdued, by compression with a bandage. Erysipelas of the scalp, when it affects the deep-seated textures, as in wounds and bruises of the head, is instantly relieved, and the danger of the disease mitigated, by a free incision carried down to the bone.

Velpeau recommends a solution of sulphate of iron in the proportion of an ounce to the pint of water, as a local application in erysipelas. This solution, he remarks, produces a sudden improvement in the patches, and causes their decline in one or two days. As frequently as new patches make their appearance, they are to be treated in the same manner, until the constitutional morbific influence is expended. In situations where a lotion would be inconvenient, this surgeon employs an ointment, containing a drachm of the salt to an ounce of lard.

Dr. Fahnestock, of Pittsburgh, speaks in great praise of pure creosote as a local application in erysipelas. It should be sufficiently strong to render the cuticle white immediately that it is applied, and should be pencilled over the whole of the inflamed surface, and for a small space beyond it. In phlegmonous erysipelas the application should be made more frequently than in the idiopathic kind, and a cold bread poultice or compress, moistened with a solution of creosote, kept on the part. When the mucous membrane of the mouth or fauces is affected, he uses a solution of nitrate of silver, of a strength of half a drachm or a drachm to the ounce.

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[1] Gazette des Hôpitaux, May 11, 1848.

Dr. James Arnott advocates congelation as a local remedy for erysipelas, and adduces numerous cases as examples of its success.

228. Phlegmonous erysipelas requires great activity of management. At the outset of the inflammatory attack the patient should be bled and freely purged. The affected part should be placed in a position to facilitate the circulation through the limb as much as possible. A number of leeches should be applied, and followed by fomentations and warm water dressing. If these means fail to restrain the progress of the disease, two or more incisions, according to the extent of the inflammation, should be made through the affected tissues, so as to divide freely the superficial and deep fascia, and offer a clear passage to any pus that may have been formed. To effect this object completely, the incisions should be two or three inches in length, and sufficiently deep. The advantages of this mode of treatment are obvious, the congested vessels of the inflamed part are relieved, and the tendency to morbid action consequently diminished. The tension, pain, and tumefaction are reduced, even where no matter is already formed; and when suppuration is established, a free outlet is given to the pus, and flakes of gangrenous areolar tissue. Whenever we are led to infer, from the severity of the constitutional symptoms, that pus is bound down by fascia, as in the hand and foot, a free incision is the proper treatment, even although no swelling may be present. After the incisions, the fomentations and warm water dressing should be continued; and on the decline of the inflammation, a bandage applied, to facilitate absorption of the fluids effused into the surrounding tissues.

The general treatment applicable to erysipelas phlegmonodes is the same as for simple erysipelas, and sedatives are especially valuable. As soon, however, as the immediate inflammatory symptoms have subsided, tonics must be employed and aided by a more generous diet.

URTICARIA.

Syn. *Uredo.* *Nettlerash.* *Fièvre ortiée porcelaine.* *Essera*, Ital.—*Urticaire*, Fran.—*Brennesselausschlag*, Germ.—*Cnidosis*, Alibert.

229. Urticaria, or nettlerash, (PLATE 7,) is a transient and non-contagious inflammation of the skin; it is characterized by the eruption of small elevations, having a round, oval, or wheel-like form, of a whiter or redder tint than the healthy integument, and surrounded by a diffused redness of greater or less intensity. Urticaria is preceded and accompanied by febrile symptoms, and is associated with more or less irritation of the gastro-pulmonary mucous membrane. The eruption is attended with itching, and a burning and tingling sensation like that produced by the sting of a nettle, and is occasionally followed by slight desquamation of the epiderma.

230. The varieties of urticaria, distinguished by Willan, are six in number, of which two are referrible to the acute, and four to the chronic form of inflammation. The six varieties are,

Acute,	*Chronic.*
Urticaria febrilis,	Urticaria evanida,
" conferta,	" perstans,
	" subcutanea,
	" tuberosa.

URTICARIA FEBRILIS.

231. Febrile nettlerash is especially characterized by the presence of severe constitutional disorder. It commences with a sense of weight and sickness at stomach, white furred tongue, quick, feverish pulse, pain in the head, anxiety, lassitude, faintness, and drowsiness. On the second day from the invasion of these symptoms, the patient is seized with rigors, which are followed by the eruption upon the skin of irregular patches, of a vivid red colour, slightly raised above the level of the surrounding surface, and studded with whitish or reddish elevations and wheals. The patches are dispersed in various situations upon the surface of the body; they appear and disappear unexpectedly, and without order, and they may be produced instantly on parts apparently unaffected, by simply rubbing or scratching the skin. They are irregular in size and form, pale and little developed during the day, but brightly red towards the evening and during the night, at which time the febrile symptoms exacerbate, and the itching and tingling become more intense and troublesome.

On the outbreak of the eruption, the pain and sickness at stomach are immediately relieved, but they are disposed to recur at each temporary disappearance of the rash. The disease usually runs its course in about a week; at the end of that period the febrile symptoms and the eruption decline; the bright and vivid red of the patches subsides into a pale and yellowish purple, and speedily disappears, leaving behind it a slight mealy desquamation of the epiderma, and sometimes œdema of the subcutaneous areolar tissue.

232. Although febrile urticaria may be regarded as a mild form of cutaneous exanthema, yet it is always troublesome and distressing to the patient, from the irritation by which it is accompanied. Frequently it creates alarm by the anxiety about the precordia, and the syncope which attend its invasion; and instances are not wanting in which it has proved fatal. "I saw it terminate fatally," says Willan, "in the case of a man about fifty years of age, who had impaired his constitution by hard labour and intemperance. On the first and second day of August, 1792, he complained of nausea, and of great pain in the stomach, which was increased on pressure. He was very thirsty, had a quick pulse, and a slight delirium at night. On the third and fourth day of August, a number of elevated wheals and red patches were diffused over the body, with much heat and itching of the skin. While the rash continued vivid, his internal complaints abated, but on its sudden disappearance about the fifth day, the febrile symptoms and delirium became more violent than at first. On the

sixth day the eruption appeared again on his face; he was, notwithstanding, very hot, restless, and delirious; he remained in the same state during the following day, and died in the evening." The same author also relates a very distressing state of this malady which occurred in a gentlewoman, twenty-seven years of age, and returned at intervals of a week for a considerable length of time.

233. Febrile urticaria frequently attacks children, particularly during teething, and in them is remarkable for its unexpected development. Dr. Underwood observes that it "occurs in children more generally under two years of age, and is exceedingly troublesome to the infant, as well as matter of surprise to parents, from the suddenness of its appearance. Children going to bed perfectly well, wake very uneasy, and frequently continue screaming for some time before the cause is discovered. But upon examining the body and lower limbs, they are found covered with large wheals, similar to those produced by the sting of nettles."

234. *Urticaria ab ingestis.*—The symptoms produced by noxious alimentary substances are very remarkable and severe; and in some instances have proved fatal, particularly when shell-fish have been the cause. The attack comes on suddenly, as, for instance, in the middle of the night after a hearty supper, or a few hours after the exciting meal. The patient suffers from weight and an uneasy feeling in the stomach, accompanied with nausea and giddiness, and sometimes by vomiting and diarrhœa, a prickling sensation in the throat, and constriction in the fauces, which produces a short, troublesome cough, and occasionally threatens suffocation; the tongue is swollen, and the voice altered, from the extension of the swelling of the mucous membrane into the larynx. The face shortly begins to swell, while the ears, the nose, and lips, are burning hot, and itch violently. By degrees the eruption spreads to the trunk of the body, and from the latter to the limbs, affecting the joints particularly. When the rash reaches the extremities, the disagreeable symptoms pass off, and the patient recovers. This kind of attack generally terminates at the end of two days, and sometimes after a few hours, leaving behind it little or no trace of its existence.

URTICARIA CONFERTA.

235. Urticaria conferta (PLATE 7, B.) is merely a severe degree of the local affection of urticaria. The elevation of the circular prominences and wheals is not so great as in the preceding variety, but they are more numerous, and frequently coalesce, and are attended with considerable inflammation of the surrounding skin. The itching and tingling are exceedingly severe, particularly at night, and the integument is tumid and swollen. This form of the affection is apt to continue for several weeks.

URTICARIA EVANIDA.

236. Urticaria evanida (PLATE 7, A. A.) is a chronic variety of nettlerash, appearing and disappearing upon the skin in the form of white, roundish prominences and wheals, without febrile symptoms,

and with trifling redness. The eruption is not the less attended with troublesome itching and tingling, particularly on the removal of the dress at bedtime, and on the return of warmth, induced by the bedclothes. It is chiefly remarkable for its duration, lasting sometimes for months, and even for years.

URTICARIA PERSTANS.

237. Urticaria perstans differs from the preceding only in the persistent character of the eruption, which does not disappear, as in urticaria evanida, but continues unchanged for two or three weeks. It occurs chiefly on the limbs, and rarely on the trunk of the body. The gastric disorder, with the itching and tingling under the influence of heat, which are typical of urticaria, are also present in the persistent variety.

URTICARIA SUBCUTANEA.

238. Under the above title, Willan has described a nervous affection of the limbs, accompanied at intervals with an eruption of urticaria. "The eruption" writes Willan, "occurs at distant periods, and continues only a few days at each return, but the patient is harassed during the intervals, as well as during the eruptions, with a violent and almost constant tingling in the skin, and with other distressing symptoms. The complaint is at first confined to one spot on the leg or arm, and commences there with a sensation of tingling, or stinging, which is afterwards felt more and more extensively along the limbs, or perhaps over nearly the whole surface of the body. Sudden changes of the temperature of the air, and agitation of mind, occasion increased uneasiness in the skin, so that pains are sometimes felt as from a sharp instrument puncturing in different directions; at other times, as from needles piercing, or pushing the skin upwards. There is usually a stiffness and slight torpor in the muscles of the parts most affected; an appearance of wheals takes place on the arms, chest, or lower extremities, from time to time, especially during the summer. In most of the cases that I have seen or known, the complaint was partial, affecting only the loins and thighs, or sometimes the arms." In illustration of this disease, Willan records the case of a lady, which appears rather to resemble a chronic affection of the spinal cord, attended occasionally with the eruption of urticaria. Stinging and pricking in the integument is a common affection in diseases of the nervous system, but this surely affords no grounds for the designation, *subcutanea*, as applied to this variety.

URTICARIA TUBEROSA.

239. Urticaria tuberosa appears chiefly in debilitated constitutions, and is a rare form of cutaneous disease. It has received its designation from being characterized by the production of elevations of considerable size, and extending deeply into the subcutaneous areolar tissue. These tumours are developed, with much itching, during the night, upon the arms and legs; they are painful and hot, and disappear before the morning, "leaving the patient weak, languid, and sore, as if he had been bruised, or had undergone much fatigue." The

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disease "often proves tedious and obstinate; I have known it continue," says Willan, "upwards of two years with a few short intervals. The only causes to which it could, with probability, be attributed in the instances presented to me were, irregularities in diet, violent exercise, taken by persons usually sedentary, and the too free use of spirituous liquors."

Dr. Day, in his translation of Simon's Animal Chemistry, observes: —"The urine in a case of urticaria tuberculosa has been analyzed by Scherer. The patient was a young man who likewise suffered from rheumatism. The urine was discharged in very small quantity, often not more than five or six ounces in forty-eight hours. It was clear, of a brownish-red colour, very acid, and its specific gravity was 1028. It contained in 1000 parts:—

Water	931·58
Solid residue	68·42
Urea	30·46
Uric acid	0·74
Alcohol extract, with much lactic acid	21·24
Water extract	4·92
Alkaline salts	8·03
Earthy phosphates	2·02

The most remarkable points in the constitution of the urine are the large amount of earthy phosphates and the excess of free acid."

In a case of urticaria, in which the urine was analyzed by Dr. Maclagan, its composition was found to be as follows:—

Urea	6·91
Uric acid	0·05
Inorganic salts	12·03
Organic matters and water	981·01

"The chief peculiarity in the present case was a deficiency in the ordinary characteristic ingredients of the urine, the urea and uric acid. This could not arise from mere excess of water; first, because the urine was not excessive in quantity; second, because the inorganic salts were above the normal standard, whereas, had the water merely been in excess, they, too, ought to have indicated a diluted condition of the urine. Dr. Maclagan ventured, therefore, to propose, as the pathological view of the case, that the defect here was merely a deficiency of the urea and uric acid; in short, a want of what modern chemists call the products of transformation of the tissues, and that the retention in this way in the system, of matters which ought to be eliminated from it, might be the cause of this cutaneous irritation, especially occurring, as it did, after meals."[1]

With the view of modifying the imperfect transformation of tissues here referred to, the patient was treated with colchicum, upon which the specific gravity of the urine was found to have risen to 1029·9, and its composition to be as follows:—

Urea	20·36
Uric acid	0·50
Inorganic salts	12·72
Organic matters and water	966·42

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[1] Edinburgh Monthly Journal.

The conclusions deduced from this observation are—

1. "That urticaria is intimately connected with a deficiency of the organic salts of the urine, and their probable retention in the system.

2. "That colchicum has an action capable of restoring the deficient salts, and thus curing the disease.

3. "Rheumatism and urticaria, and purpura and urticaria, are frequently found to be present together. They are also benefited by the use of colchicum. It may be safely asked, do they not depend on the same common cause—namely, the presence of those salts in the blood? Such an inference has been applied in the case of rheumatism."[1]

240. *Diagnosis.*—The diagnostic characters of urticaria are, *firstly*, the appearance of the eruption, which resembles the whitish elevated spots and wheals produced by nettles; *secondly*, the itching, tingling, and pricking which accompany the eruption; *thirdly*, the evanescent and fleeting habits of the eruption; and *fourthly*, its association with symptoms of gastric irritation. These characters, well appreciated, sufficiently distinguish it from every other cutaneous eruption.

The only affections to which urticaria bears so close a resemblance as to deserve remark, are, lichen urticatus, and erythema papulatum, tuberosum and nodosum. The pimples of lichen urticatus are, however, smaller and more persistent than the wheals of urticaria; they appear in successive crops, and become surmounted by a small, dark-coloured crust. Erythema papulatum resembles urticaria both in general and local symptoms, but differs in its course and persistency. The spots of erythema tuberosum are quite superficial and persistent, as are those of erythema nodosum; characters which distinguish these eruptions from that of the transient and quickly fading urticaria tuberosa.

Urticaria is occasionally complicated by the presence of other diseases of the skin, as erythema, roseola, lichen, and impetigo. It has also been observed as a complication of rubeola, variola, and prurigo.

241. *Causes.*—The causes of urticaria are referrible to irritation of the gastro-pulmonary and genito-urinary mucous membranes. Thus it is induced by dentition, by gastric irritation, by intestinal irritation, by uterine irritation, and, more rarely, by pulmonary irritation. Mental excitement or anxiety, fatigue, exposure to cold or heat, also contribute towards its development, and occasionally it is seen in association with rheumatism. Among the causes of urticaria, nervous debility, occasioning a peculiar susceptibility of the cutaneous nerves, must not be omitted. In a lady who was lately under my care, I have watched the red wheals appear and creep along the skin and disappear, while I purposely engaged her in conversation on indifferent subjects. A word, a look, the slightest excitement, would immediately bring out a copious eruption. It occurs chiefly in the summer season, and is said to be more prevalent in cold climates, as that of Russia, than in those of the south. Persons who possess a thin and irritable skin, who are plethoric and of a sanguine temperament, are most liable to the disease, and for this reason it is more

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[1] Lancet, vol. ii. 1846, p. 160.

common in the female than in the male sex. It is very frequent in children, particularly during the period of dentition.

The alimentary substances which are capable of exciting urticaria act upon the system by means of the irritation which they cause to the mucous membrane of the alimentary canal. In some instances, this irritation is referrible to the natural susceptibility of the individual; while in others the probable cause is a poison generated by putrefactive decomposition. The substances which have been observed to give rise to these effects in different persons, are very numerous; they are some kinds of fish, as mussels, lobsters, crabs, prawns, shrimps, oysters, dried fish, &c., certain meats, such as pork, goose, &c., certain fruits and vegetables, as almonds, strawberries, raspberries, cucumbers, mushrooms, &c. Rayer mentions oatmeal gruel, as occasionally producing this effect; and certain medicines, as valerian, copaiba, &c. A member of my own family suffers, constantly, after taking rice milk. Dr. Gregory was affected by the disease, after eating part of a cucumber; and he mentions two instances of persons attacked in a similar manner from drinking porter. Dr. Winterbottom was "twice violently affected, by eating the sweet almond." Urticaria has been observed occasionally as a critical eruption, and it has been stated by some authors to have occurred epidemically.

Persons of great cutaneous susceptibility have the power of exciting the eruption at any time, by merely scratching the skin.

242. *Prognosis.*—Urticaria is not, in itself, a dangerous disease. The acute form is easily removed by appropriate treatment. Chronic urticaria is frequently symptomatic of nervous debility, mucous irritation, or visceral disorder, and may consequently prove obstinate, resisting all therapeutic measures, until the disease of which it is a dependence is relieved. Retrocession of this eruption has sometimes been followed by a serious aggravation of internal disease.

243. *Treatment.*—The treatment of febrile urticaria should be strictly antiphlogistic; in some cases it may be advisable to deplete by general bleeding; in others, abstraction of blood from the neighbourhood of the organs especially affected, by means of leeches, may suffice. The rest of the treatment should consist in the administration of aperients, maintaining an abstemious and cooling diet, using the warm bath and foot bath occasionally, and if the seat of the visceral disorder be apparent, applying a blister over the organ affected. During convalescence, if the powers of the system have been reduced, tonic medicines, combined with alkalies, should be prescribed.

Where difficult dentition is the cause of the eruption, the gums must be laid freely open with the lancet; the little patient should be immersed once or twice daily in a warm bath, and some gentle antacid aperient administered.

When the cause of the eruption is the ingestion of noxious and indigestible substances, no time should be lost in obtaining the ejection of the offending matters. For this purpose, the sulphate of zinc, or sulphate of copper, are best suited; or if these be objected to, the ordinary emetic of ipecacuanha, either alone, or combined with tartarized antimony. Willan cautions us to avoid the latter salt, from its liability to operate too violently, and give rise to faintings. The employment of the emetic should be followed by a dose of castor-oil or some simple cathartic; and Plumbe recommends from twenty to forty drops of ether, to be given every half-hour.

Chronic urticaria calls for the use of aperients, counter-irritants, tonics, warm and cold baths, particularly the sponge bath and shower bath, careful attention to regimen, and the avoidance of all indigestible substances. I have derived the greatest amount of success, in the treatment of chronic urticaria, from the use of warm aloetic purgatives, combined with the citrate of iron, or nitro-muriatic acid in a bitter infusion or tincture. The influence of dietetic substances was shown in the fact that, in one patient, sugar was exhibited with advantage, and in the same case great benefit was derived from the citrate of iron, at first combined with the hydriodate of potash, and subsequently with quinine. In another case, the infusion of serpentaria with carbonate of magnesia and carbonate of ammonia was completely successful. In a third, a course of sulphate of magnesia in drachm-doses, combined with carbonate of magnesia and iodide of potassium, cured the patient after other means had failed; and, in a fourth, five grains of colchicum were usefully substituted for the iodide. Urticaria tuberosa is often so severe as to require depletion by venesection, and active antiphlogistic measures. Whenever urticaria assumes an intermittent form, it must be treated with bark or quinine, like ordinary intermittent fever.

The intense itching and tingling which frequently accompany urticaria are best relieved by means of narcotics. Acetous and alcoholic lotions and lemon-juice are sometimes useful for a similar purpose, and a lotion composed of carbonate of ammonia, and acetate of lead, of each a drachm, combined with eight ounces of rose-water, has been recommended. I have found a lotion of chlorate of potash sometimes succeed in quelling the pruritus of this and other eruptions; but that upon which I chiefly rely is one composed of bichloride of mercury, from five to ten grains, spirit of rosemary and spirit of wine, of each an ounce, and six ounces of the emulsion of bitter almonds.

If the eruption show a disposition to recede, or if it have already receded, blisters should be applied to the skin; or the surface well rubbed with some stimulating liniment, such as that of croton-oil, in order to restore the eruption, or set up an equivalent action in the skin.

ROSEOLA.

Syn. *False Measles. Rose-rash. Roseole,* Fran.

244. Under the name of roseola, Willan has described certain forms of cutaneous inflammation, some of which seem to occupy a middle position between erythema, urticaria, and rubeola, without being strictly referrible to either; while others ought more properly to be considered under one or other of the before-mentioned orders. The title of this affection is, perhaps, the most objectionable in the entire nomenclature of diseases of the skin, since colour can only be an ac-

cidental character, depending for its existence upon a greater or less congestion or distention of the vascular rete of the derma, and, therefore, liable to constant change from trivial causes. The true characters of the disorder must evidently be sought in the morbid conditions which collectively constitute the real disease. With these remarks, I shall proceed to define roseola by means of those symptoms which appear to be characteristic of the affection.

Roseola (PLATE 7) is a non-infectious and non-contagious inflammation of the skin; it is characterized by febrile symptoms which assume the sub-acute type, by patches of redness, of small size and irregular form, distributed over more or less of the surface of the body, and by more or less redness of the fauces. The exanthema is transient, is accompanied by more or less prickling or tingling of the skin, is brightly red or crimson at first, subsides gradually into a dull roseate tint, and disappears by degrees; often leaving behind it petechial or ecchymosed spots and the discoloration which follows a bruise.

245. Willan has described seven varieties of roseola, to which three—namely, roseola rheumatica, arthritica, et cholerica—have been added by Bateman and Rayer, and one, roseola punctata, by myself. The whole of these forms may be arranged into two groups:—*idiopathic*, in which the exciting cause is not immediately manifest; and *symptomatic*, which depend obviously upon some local source of irritation, or are associated with some existing disease. These are—

Idiopathic.	*Symptomatic.*
Roseola infantilis,	Roseola variolosa,
" æstiva,	" vaccina,
" autumnalis,	" miliaris,
" annulata,	" rheumatica,
" punctata,	" arthritica,
	" cholerica.

ROSEOLA INFANTILIS.

False Measles.

246. In roseola infantilis, the patches of redness are of small size, and closely grouped together, and resemble, in general appearance, the eruption of rubeola. They are subject to much variety in relation to extent, duration, and the local inconvenience to which they give rise. Thus, in one case, they are limited to a small district of the skin, or to the limbs, while in others they are dispersed over the entire body. In one case, again, they are fleeting, and disappear in the course of a day or two, while in others they are prolonged to a week or more. Sometimes they are productive of little inconvenience, and at others excite itching and tingling of the most wearying kind. The constitutional symptoms, like the other characters of the affection, are marked by uncertainty in respect of degree; in some subjects the febrile indications are severe and active, while in others they are transient, and speedily decline.

ROSEOLA ÆSTIVA.

False Measles.

247. Roseola æstiva (PLATE 7, E.) is the common form under which the disease presents itself in the adult: it is developed, as implied by its name, chiefly in the summer season, and attacks persons of a weakly and irritable state of system, particularly of the female sex. The disorder usually commences with the ordinary series of febrile symptoms of the slighter kind—namely, with chills, succeeded by flushes of heat, languor, pains in the head, back, and limbs, restlessness, quickened pulse, and thirst. These are followed, in a few days, varying in number from three to eight, by an eruption appearing first about the face, neck, and arms, and then extending to the body and lower extremities. In general appearance, the rash resembles rubeola, but on closer examination is found to consist of patches of larger size, and more irregular form, and, at a later period, the difference is still more striking, in consequence of the change of tint to a dark roseate hue. The fauces are also affected by the disease, presenting a deep red tint, with some degree of swelling of the mucous membrane, and enlargement of the tonsils. The eruption appears ordinarily in the evening, and arrives at its height on the following day, being accompanied by tingling and considerable itching. On the fourth day, the rash begins to fade, and on the fifth, disappears, together with the constitutional symptoms.

The eruption is sometimes local in its attack, being confined to the face and neck, which become tumefied, and exceedingly painful. It is liable also to delitescence, in which case the constitutional symptoms are aggravated, and relieved only by the reappearance of the rash.

ROSEOLA AUTUMNALIS.

248. Roseola autumnalis is met with chiefly among children, but I have seen it also in the adult, and it occurs generally during the autumnal season. The constitutional symptoms are very slight, being limited to a trifling indisposition, with congestion of the fauces. The eruption appears in roundish circumscribed patches, of about the size of a shilling, and of a very dark hue, seeming, at a distance, "as if stained by the juice of black cherries or mulberries." The patches occur the most frequently upon the arms and legs, rarely on the face and body. They continue for about a week, give rise to very little itching or local inconvenience, and are succeeded by a slight furfuraceous desquamation.

ROSEOLA ANNULATA.

249. This form of roseola is characterized by the figure of the eruption, appearing, in the first instance, as small, red, circular spots, and increasing in a short space of time into rings of variable size, having a central area of healthy skin. This eruption possesses all the general characters of roseola, as described in roseola æstiva. It appears after a slight attack of constitutional symptoms, which are relieved by the outbreak of the eruption, and aggravated if it should

chance to recede; it occasions considerable itching and tingling of the skin during the night, so as frequently to destroy rest, and affects, more or less extensively, the mucous membrane of the fauces. When the disease sets in with severe symptoms, it terminates, like roseola æstiva, at the end of a week or ten days. When, however, it assumes a milder type, it may endure for several months, and recur at intervals. Willan relates the case of a lady who suffered from this disease for several months together, for three successive years.

ROSEOLA PUNCTATA.

Roseola punctata is a rare affection, of which I have seen only a few examples. Its characters, according to my observation, are as follow:—

Febrile symptoms of a sub-acute type, accompanied with redness of the eyes, slight coryza, redness of the fauces, and swelling of the mucous membrane of the mouth, ushering in an exanthema at the end of three days; the exanthema appearing on the mucous membrane and skin; on the latter, in the form of small red spots around the mouths of the follicles, then becoming diffused so as to cover the greater part of the body, reaching its height on the third day; at first, of a bright raspberry-red colour, afterward acquiring a dull roseate hue, the dulness increasing with the progress of decline; *the primary red spots resembling dull red stains* as decline advances, and fading by degrees, after the disappearance of the rash; the entire attack lasting ten days, of which three belong to the febrile period, three to the exanthema, and four to its decline, the dark stains being perceptible for some days afterwards, the rash assuming a difference of form on different parts of the surface, such differences being all referrible to roseola. The following is an example of this form of exanthema. For the opportunity of observing it, I am indebted to Mr. Marson, the resident-surgeon of the Small-pox Hospital, who, during a connexion of twelve years with that hospital, has seen not more than ten cases:—

A young man, aged twenty-four, of good constitution, engaged as light porter in a draper's house in Oxford street, exposed himself to cold by riding on the outside of an omnibus during the prevalence of cold winds. At the end of his journey he felt chilled, and, in the course of the same evening, experienced headache, pain in his limbs, and sensations of general illness.

Sept. 8th.—On the following morning, after a restless night, he arose fatigued; his headache had increased; his appetite was gone, and he performed his duties painfully and wearily. He was chilly during the day, and in the evening feverish; had a dry mouth, and retired early to bed.

9th.—He had still greater difficulty in getting through his work to-day than yesterday. His symptoms were the same, but increased in severity. At night, after getting to bed, he smoked a cigar, and took a basin of gruel, and being well covered up, broke out in a profuse perspiration.

10th.—This day he scarcely felt able to rise from his bed; but succeeded in getting down stairs and cleaning some knives. While engaged in that occupation he observed an eruption of small red spots on his arms, and soon afterwards returned to his bed. On taking off his clothes, he found his whole body covered with spots, the upper parts being most, and the lower least affected. He remarked, also, that his eyes looked red, that his lips were swollen, and that there were red spots likewise inside his mouth.

11th.—Having been seen this day by a medical man, he was sent to the Small-pox Hospital, under the impression that the eruption was incipient small-pox. At this time the eruption consisted of small red spots, the centre of each spot being very slightly raised, and corresponding with the aperture of a cutaneous follicle.

12th.—The redness of the eyes, accompanied with coryza in a slight degree, the swelling of the lips, and the spotted state of the mucous membrane of the mouth, were at their height to-day, and to these symptoms was superadded a cough, making the general symptoms very similar to those of rubeola. The red spots had now become confluent, and assumed the character of patches, which covered the greater part of the body. The congested skin was slightly raised above the level of the unaffected parts, and the colour presented the raspberry hue of measles.

13th.—The patient's eyes were still somewhat congested, his lips were swollen and dry, the mucous membrane of the mouth was thickly covered with red spots, the fauces were red, his tongue was coated with a white, moist deposit, which was beginning to separate in flakes, leaving the surface beneath quite smooth, and he uttered occasionally a short, mucous cough.

The efflorescence had a decidedly rubeolous hue, but offered some variety of appearance on different parts of the body. On his face, which was somewhat swollen, the patches of redness were irregular in form, and diffused.

On the trunk of the body, and particularly on the abdomen, the efflorescence presented the ordinary rubeolous appearance of common roseola.

On the arms and legs the red patches had run together, so as to cover the greater part of the skin, and form a dull, red ground, which was studded all over with spots of a dark red colour. These spots, which I have assumed as the specific character of the eruption, were the original red points by which the efflorescence commenced. They presented a deeper red than the rest of the surface, were about two lines and a half in diameter, and were dark and slightly raised in the centre. The redness was partly the effect of congestion, and partly of the transudation of the colouring principle of the blood, and in some few situations, as around the ankles, and upon the back of his shoulders, where the weight of his body rested, there was a decided ecchymosis from the latter cause. It was obvious that these red points represented the follicles of the skin, in which the inflammation commenced, and the elevated centre was the pore raised above its natural level, as a joint effect of the congestion of the capillary vessels, and effusion into the meshes of the vascular network.

On the neck, the efflorescence appeared in the form of patches distinctly circumscribed, slightly elevated, more or less circular in figure, and of an average size of half an inch in diameter. On careful examination, these patches were seen to be formed by the confluence of a number of small circular congested spots, each taking its rise around the aperture of a follicle, and many of these separate spots, of about a line in diameter, were sprinkled in the interspaces of the patches. In several of the larger patches there were one or more yellowish spots, which, at first sight, gave the idea of the elevations of urticaria, but which the changes succeeding on the following day proved to be fading points indicating the decline of congestion. The increase of these pale spots gradually converted the patches into rings, and the latter finally disappeared. I must remark that the spots above referred to were quite distinct from the deeper coloured and star-like spots on the arms, which suggested the specific name "punctata," which I have given to the disease.

14th.—The eruption is now on the decline. The efflorescence is of a duller hue; the spots have more the character of stains than yesterday; and the patches on the neck are converted into rings; on the abdomen, chest, and thighs, the efflorescence is fading away, like ordinary roseola. The thin skin of the penis has a remarkable appearance, from being covered with deep rose-red stains.

On Friday, and the two following days, the general symptoms improved, while the efflorescence continued to fade, and on Monday he was sufficiently well to be re-vaccinated, and to leave the hospital.

ROSEOLA VARIOLOSA.

250. Variolous roseola is an erythematous inflammation of the skin, which not unfrequently attends upon the eruptive fever of inoculated small-pox, appearing on the second day from the commencement of the constitutional symptoms, and upon the ninth or tenth after inoculation. It shows itself, in the first instance, on the breast, the face, and arms, and then extends, during the second day of its eruption, to the trunk and lower extremities; on the third day, the roseate rash diminishes in vividness, and on the fourth, subsides altogether. The proportion in which roseola occurs in inoculated small-pox, is one in every fifteen cases. In natural small-pox it is more rare.

Variolous roseola has been regarded as favourable to the prognosis of small-pox, and indicative of a mild eruption. When, however, the colour of the rash is deep and dusky in its tint, and the eruptive fever severe, the most dangerous form of small-pox may be apprehended. In some instances of inoculation, the roseola has been known to supersede the eruption of the small-pox, and the patient is said to be equally protected against variolous infection. It occurs chiefly in persons endowed with a delicate and irritable skin.

In the management of cases of this affection, it is desirable to guard against the retrocession of the rash. For this purpose, the patient should be confined to his room, although children so affected are frequently carried into the air, and exposed to the cold without any inconvenient results.

ROSEOLA VACCINA.

251. Roseola vaccina is an efflorescence similar to that which accompanies variola; it follows the development of the vaccine vesicle, appearing on the ninth or tenth day, but much more rarely than after inoculation. It occurs in the form of small erythematous patches, which seem to be propagated from the inflamed halo of the vaccine vesicle, and, in some instances, are diffused over the entire surface of the body. The eruption rarely lasts more than two days, and appears only in children possessed of a delicate and irritable skin.

ROSEOLA MILIARIS.

252. Under the name of roseola miliaris, Bateman describes an erythematous inflammation of the skin, accompanied by the development of small vesicles, which he observed towards the close of continued and typhoid fevers. This eruption consisted of oval-shaped and slightly raised patches, which appeared upon the arms and breast, and were accompanied by a decided remission of the febrile symptoms. The patches increased in size for the space of three days; they were of a bright rose colour at first, diminishing gradually in redness, and assuming a bluish tint, and at the end of this period they disappeared altogether.

ROSEOLA RHEUMATICA ET ARTHRITICA.

253. Rheumatic and arthritic roseola is an erythematous inflammation of the skin, appearing in spots and patches, of various size and form, and upon different parts of the body, in persons affected with rheumatism or gout. In some instances, the efflorescence precedes the attack, which invades immediately upon its decline; in other cases, the eruption appears during the progress or towards the close of the disease. In Wurzburg, where rheumatism is endemic and very severe, the exanthem makes its attack at the commencement of the disease, and after one or two days of suffering from gastric and febrile affection. The eruption in this case consists of small roundish spots, which first show themselves upon the legs, and thence extend to the rest of the body. They present the deep rosy colour, subsequently becoming purplish and livid, which is characteristic of roseola.

ROSEOLA CHOLERICA.

254. This form of roseola rests upon the observation of Rayer, who saw the variety during the prevalence of cholera, in Paris, in 1832. "After the period of reaction," he says, "there occurred in some patients, especially in women, an eruption which, most generally, appeared on the hands and arms, and then extended to the neck, the breast, the belly, and the upper and lower extremities. At its commencement it was characterized by patches, for the most part of an irregularly circular shape, of a bright red colour, elevated above the surface, and but slightly itchy. Very numerous on the hands, arms, and chest, they were less so on various other parts; in some places they were crowded together, tended to confluence, and had an appearance very analogous to the efflorescence of slight scarlet fever; in other

places, the aspect of the eruption was rather like that of measles, and in others even more like that of urticaria.

"I have seen this inflammation complicated with an inflammatory affection of the fauces and tonsils, and its disappearance followed by an aggravation of the general symptoms, and, sometimes, even by death. On the chest, the spots occasionally became confluent, and gave rise to patches as broad as the hand, raised above the general level, and pretty well defined. The eruption then acquired a dirty pink or rose colour. About the sixth or seventh day, the epiderma cracked, and was thrown off in large flakes on almost all the places where the eruption had existed."

255. *Diagnosis.*—Roseola is distinguished from other exanthemata by negative rather than by positive characters. The diseases with which it is most likely to be confounded are, rubeola, scarlatina, erythema, urticaria, and purpura.

The varieties of roseola the most nearly allied in appearance to rubeola, are, roseola infantilis and roseola æstiva; but particularly the former, which is probably frequently mistaken for measles, and indeed is known by the trivial name of "false measles." The diagnostic characters by which it is distinguished from rubeola are, the absence or extreme mildness of the catarrhal symptoms, the inferior degree of febrile affection, the larger size, more irregular form, and deeper colour of the patches, their progress from the extremities to the trunk of the body, and, above all, the uniformity of the redness as contrasted with the punctiform character of that of rubeola. Moreover, the latter is contagious, and is generally of epidemic origin, which is not the case with roseola. These remarks apply equally to the diagnosis between roseola and scarlatina, substituting for the catarrhal symptoms of rubeola the angina of scarlatina.

The degree of congestion affecting the skin in roseola is very similar to that of erythema; in both, the patches are irregular, and uniform in tint, but in the former are for the most part smaller than in the latter, and of a venous character. The form originating in local irritation would more correctly be considered under the genus erythema.

From urticaria, the distinction of roseola lies in the light coloured and raised spots and wheals of the former, as contrasted with the more uniform redness of the patches of the latter. Sometimes, as in roseola annulata, the red spots have pale centres even at their outbreak, but there is no elevation as in urticaria. The local inconvenience, also, is greater in urticaria; for although, in both, itching and tingling are prevailing characters, these symptoms are more severe in urticaria, and are accompanied by pricking and stinging.

256. *Causes.*—Roseola is met with in children, in persons with a thin and delicate skin, of weakly and irritable constitution, and particularly in females. In infants, the exciting cause is teething, or intestinal irritation. In adults, it may be occasioned by any causes which disturb the functions and circulation of the skin during its periods of increased activity—namely, in the summer season. Of this kind are, exposure to a draught of cold air, when the body is heated by exercise; drinking cold water while the body is warm; distressing the stomach

with an overload of fruit, indigestible substances, copaiba, &c. Other causes are, gastric and intestinal irritation, and disordered menstruation. The forms called into action by local irritation are obvious in their causes, while those which accompany rheumatic gout or cholera are referrible to some unexplained nervous sympathy between the tissues affected and the skin.

257. *Prognosis.*—Roseola is a slight affection, and one of favourable termination. When it occurs critically in connexion with constitutional disease, it is of good omen, and should be encouraged.

258. *Treatment.*—In the treatment of roseola, the cause, when obvious, should be removed; in the case of children suffering from dentition this is best effected by scarifying the gums, and exhibiting a dose of castor-oil; and where intestinal irritation is in fault, by the hydrargyrum cum cretâ combined with rhubarb, or soda with rhubarb, to regulate the secretions, these measures being assisted by a light and moderate diet. In adults, laxatives and diluents, followed, in weakly persons, by tonics combined with mineral acids, are the appropriate remedies. The varieties accompanying particular diseases call for the treatment applicable to those diseases; as, for instance, colchicum in the case of rheumatism, &c. When disordered menstrual function is the exciting cause, recourse must be had to steel medicines, aloetic aperients, &c. Locally, a gently stimulating lotion will be found of service, such as one containing spirit of horseradish, mustard, rosemary, or tincture of cantharides; or a weakly acid lotion. Baths are also useful, and particularly sea-bathing.

ERYTHEMA.

Syn. *Inflammatory blush. Efflorescence cutanée*, Fran.—
Hautröthe, Germ.—*Dartre erythemoïde*, Alibert.

259. Erythema[1] (PLATE I., G.—K.) is a superficial inflammation of the skin, which is characterized by a diffused or circumscribed redness occurring in one or several patches of irregular form, and varying from a few lines to several inches in extent. It is non-contagious, occasionally produced by local irritation, but frequently symptomatic of constitutional disturbance or visceral disease. In the commencement of erythema the derma is a little swollen; the swelling, however, speedily subsides, the redness remaining for a much longer time. Upon the dispersion of the redness, the skin retains for some days a purplish and bluish tint, and the epiderma exfoliates in the form of a furfuraceous and laminated desquamation.

260. There are two degrees of erythema—acute and chronic. Acute erythema presents for our observation eight principal varieties—namely,

Erythema fugax,
„ circinnatum,
„ marginatum,
„ læve,

Erythema intertrigo,
„ papulatum,
„ tuberculatum,
„ nodosum.

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[1] Der. ερυθαινειν, to redden.

These varieties admit of arrangement into three groups, symptomatic, local, and general or idiopathic. The *symptomatic* kinds are, erythema fugax, erythema circinnatum, and erythema marginatum. The *local* group comprehends erythema læve, a disease depending on the local condition of the limb, and very appropriately designated by Good, erythema œdematosum, and erythema intertrigo, the consequence of local irritation. The *general* or *idiopathic* varieties are, erythema papulatum, tuberculatum and nodosum, which are preceded and accompanied by general febrile symptoms, and are very closely allied to each other.

ERYTHEMA FUGAX.

261. Erythema fugax appears in the form of diffused patches of redness, which are variable in depth of colour and extent, and occur for the most part upon the upper regions of the body, as upon the face and neck, the trunk and the arms. The redness of this form of erythema is especially characterized by its evanescent and fleeting disposition, one while vanishing suddenly, to re-appear at successive periods, another while subsiding on one spot, to break forth on several, and again continuing fixed for a short period, to disperse slowly and by degrees. It is attended by considerable heat and dryness of the surface, and sometimes by swelling. At its decline, the epiderma is left rough and furfuraceous, from the disturbance to which the formative function of the derma has been subjected.

Erythema fugax is chiefly important as a symptom of visceral derangement, and in some instances it may be regarded as an indication of the long continuance and danger of such disorder. It is particularly noticed in connexion with irritation of the mucous tissues of the body, as of the alimentary mucous membrane, the respiratory membrane, the generative membrane, and the urinary mucous membrane. In my notes for the past three years, I find references to cases in which this form of exanthema has appeared in conjunction with dyspepsia, diarrhœa, hepatitis, bronchitis, hysteria, anomalous uterine irritation, pregnancy, inflammation of the kidneys, &c. It is also seen in some nervous affections and fevers, and Willan records a fatal case of puerperal fever in which erythema fugax was a conspicuous symptom. This inflammation is most frequently observed in the female sex.

I had lately under my care a striking instance of this affection in the person of a young military officer, who was not aware of any disturbance of his general health. The efflorescence was attended with swelling, and would come on in the course of an hour, and after the continuance of a few hours subside as rapidly as it had appeared. His attention was generally drawn to the seat of the disease by some degree of itching, and upon examining the part, the redness and swelling were perceived. Trifling as the disorder appeared, it was to him a source of serious annoyance; it sometimes made its appearance while he was engaged in military duty, or dressing for a dinner party, fixing, for example, upon the cheek, and completely closing his eye, from tumefaction of the lids. I succeeded in curing him of this disorder, by means of regular doses of the compound colocynth pill, with tincture of gentian and the mineral acids, and tannin.

ERYTHEMA CIRCINATUM.

272. Erythema circinatum (Plate I. E.) appears in the form of small, round, and very slightly raised patches of redness, which enlarge by their circumference, while the redness in the centre fades and disappears. In this manner, a number of rings with broad margins are produced, which run over the whole surface of the affected region, and, as they increase, communicate by their borders, and give rise to a number of irregular and broken bands resembling segments of circles of various magnitude. The central portion of the rings, and the surface which has been left by the erythema, has a yellowish tint, and throws off a furfuraceous desquamation. The duration of erythema circinatum is greatly dependent upon the nature of the disease with which it is associated; it may be stated generally at from one to three weeks.

I have before me the notes of a case of this form of erythema, associated with acute rheumatism, which occurred in the hospital practice of Dr. Watson. The spots were first developed on the abdomen, and quickly spread from this point as from a centre, until they had occupied with their curves the whole surface of the trunk of the body and of the limbs. The case in other respects presented no characters different from ordinary rheumatism; the symptoms of the latter were neither aggravated nor relieved by its invasion, and it appeared to be developed in connexion with augmented perspiration.

ERYTHEMA MARGINATUM.

273. Erythema marginatum is an aggravated form of erythema circinatum, occurring, for the most part, in association with chronic visceral disease, and in elderly persons. In this variety there is a greater degree of congestion of the skin than in the preceding; there is a deeper but variable tint of redness, which frequently approaches to a purplish hue; the border of the circles is more raised, and slightly papular, and the margin is abrupt and well defined. Like erythema circinatum, the present variety presents considerable difference of appearance at different stages of its progress; at one time exhibiting a distinctly annular form, at another, an assemblage of raised and inflamed bands, having more or less of a curved direction. This diversity of appearance of the disease at different stages of its progress enables us to comprehend the apparent dissimilarity in the definition of erythema marginatum, as given by Willan and Bateman, and by Rayer. The latter of these authors describes the early stage of the exanthem, when he remarks that it consists of "circular patches of a livid red, from half an inch to an inch in diameter, the circumference of which is distinctly separated from the healthy skin, raised, prominent, and slightly papular;" while Willan and Bateman, taking the latter stages as their type, describe the marginal ridge as existing only on one side of the patch, the redness diffusing itself gradually in the rest of its circumference. The eruption may occur upon all parts of the body, but is most frequently seen upon the trunk, particularly in the loins, and on the outer sides of the limbs. Its duration depends on the nature of the disease which it accompanies; it generally extends to several weeks.

ERYTHEMA LÆVE.

E. œdematosum.

266. Erythema læve is an inflammation of the skin associated with œdema, and appearing for the most part in the lower extremities. When, however, the vital powers of the system are reduced, it may be developed in any dependent part of the body. In the lower limbs it commences around the ankles by several small spots, which, by their increase, speedily form a patch of considerable extent. The inflamed surface is smooth, shining, and of a bright red colour; it is more or less swollen from distention of the subcutaneous areolar tissue with serous fluid, and is attended with itching, and by a painful sensation of tension. When left to itself, œdematous erythema may continue without change for several weeks, and may terminate eventually in ulceration or mortification. When it issues in resolution, the swelling subsides, although the œdema may still remain for some time longer; the brighter hue of redness merges into a purplish and livid tint, and the skin is long before it regains its natural appearance. Moreover, the epiderma desquamates in thin lamellæ.

There is a form of erythema læve which is very common in persons beyond middle life, and which affects the legs, extending from the instep and ankle to the hollow below the knee. The legs are more or less swelled, they pit on pressure, the œdema being greatest around their lower part; they are hot, painful, itchy, particularly in the evening and in bed, and they are more or less reddened by a patchy and irregular redness. In this particular, also, there is a good deal of variety; sometimes the redness is general and vivid, and at other times hardly discernible. In either case, if the skin be closely examined, it will be found to have the appearance of being cracked all over, which is really the fact. From the distention which has taken place, the cuticle has given way, and the derma, corresponding with the lines of rupture, looks red and angry, and forms a network of rough, more or less raised lines over the affected skin. The small islets of unbroken skin between the lines are more or less smooth, but sometimes roughened by the exfoliation of the cuticle from their surface. Their edges, corresponding with the line of ruptured cuticle, is also rough, and in some instances their appearance is such as to suggest a comparison with the scaly integument of a serpent.

Not unfrequently, there is an oozing of an ichorous fluid from the inflamed lines; in which case the secretion dries, and forms a thin crust, and the eruption might be mistaken for eczema. At other times the inflamed lines have a papular character, and the case might be considered to be one of lichen. This form of erythema læve is often troublesome and tedious, equally annoying to the patient and to his physician.

In young persons erythema læve is an occasional result of sedentary habits, or of fatiguing exertion in close apartments. Those of the lymphatic temperament are most liable to its attack, and it is not unfrequently observed in chlorosis. In adults it sometimes appears without any more obvious cause than disorder of the digestive sys-

ERYTHEMA CIRCINNATUM.

262. Erythema circinnatum (PLATE I., K.) appears in the form of small, round, and very slightly raised patches of redness, which enlarge by their circumference, while the redness in the centre fades and disappears. In this manner, a number of rings with broad margins are produced, which run over the whole surface of the affected region, and, as they increase, communicate by their borders, and give rise to a number of irregular and broken bands resembling segments of circles of various magnitude. The central portion of the rings, and the surface which has been left by the erythema, has a yellowish tint, and throws off a furfuraceous desquamation. The duration of erythema circinnatum is greatly dependent upon the nature of the disease with which it is associated; it may be stated generally at from one to three weeks.

I have before me the notes of a case of this form of erythema, associated with acute rheumatism, which occurred in the hospital practice of Dr. Watson. The spots were first developed on the abdomen, and quickly spread from this point as from a centre, until they had occupied with their curves the whole surface of the trunk of the body and of the limbs. The case in other respects presented no characters different from ordinary rheumatism; the symptoms of the latter were neither aggravated nor relieved by its invasion, and it appeared to be developed in connexion with augmented perspiration.

ERYTHEMA MARGINATUM.

263. Erythema marginatum is an aggravated form of erythema circinnatum, occurring, for the most part, in association with chronic visceral disease, and in elderly persons. In this variety there is a greater degree of congestion of the skin than in the preceding; there is a deeper but variable tint of redness, which frequently approaches to a purplish hue; the border of the circles is more raised, and slightly papular, and the margin is abrupt and well defined. Like erythema circinnatum, the present variety presents considerable difference of appearance at different stages of its progress; at one time exhibiting a distinctly annular form, at another, an assemblage of raised and inflamed bands, having more or less of a curved direction. This diversity of appearance of the disease at different stages of its progress enables us to comprehend the apparent dissimilarity in the definition of erythema marginatum, as given by Willan and Bateman, and by Rayer. The latter of these authors describes the early stage of the exanthem, when he remarks that it consists of "circular patches of a livid red, from half an inch to an inch in diameter, the circumference of which is distinctly separated from the healthy skin, raised, prominent, and slightly papular;" while Willan and Bateman, taking the latter stages as their type, describe the marginal ridge as existing only on one side of the patch, the redness diffusing itself gradually in the rest of its circumference. The eruption may occur upon all parts of the body, but is most frequently seen upon the trunk, particularly in the loins, and on the outer sides of the limbs. Its duration depends on the nature of the disease which it accompanies; it generally extends to several weeks.

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In young persons erythema læve is an occasional result of sedentary habits, or of fatiguing exertion in close apartments. Those of the lymphatic temperament are most liable to its attack, and it is not unfrequently observed in chlorosis. In adults it sometimes appears without any more obvious cause than disorder of the digestive system, particularly in persons of intemperate habits. In persons of advanced life the affection is by no means uncommon, and occurs as a consequence of over-exertion in standing or walking. It is also a frequent complication of the œdema which accompanies varicose veins and anasarca. The local affection is usually accompanied by slight febrile symptoms, and by some degree of constitutional disorder.

ERYTHEMA INTERTRIGO.

267. Erythema intertrigo[1] is that form of cutaneous inflammation which is induced by chafing the skin, either by the friction of one surface of the integument against another, by the friction or pressure of dress, by the irritation of secretions and discharges flowing over the surface, or by the presence of any cause of irritation whatever, as over-distention of the skin, eruptive affections, &c. This inflammation is attended with little or no swelling; but when it occupies the folds of the skin, whence the perspiratory fluid does not easily escape, or is produced by contact of secretions, the abraded derma pours out a sero-purulent ichor, which excites a troublesome itching. If the cause of irritation continue for some time, the skin becomes excoriated, and deeply chapped. The cutaneous inflammation produced by pressure on the skin is termed erythema paratrimma.

Erythema intertrigo, from the friction of adjoining surfaces, is met with between the folds of the skin of infants, as between the buttocks, between the thighs, around the umbilicus, and in the groins, particularly if the points be moistened by secretions, or unprotected by cleanliness; in the folds of the skin of fat persons, especially in warm weather; upon the face, from the overflow of tears, the saliva, or the secretion of the nose; upon the vulva, the prepuce, and the scrotum; around the anus, and between the toes. A most distressing case of intertrigo in both groins, with condylomata, and profuse, offensive, glairy secretion, occasioned by the irritation of discharges from a carcinomatous uterus, is at present (1842) under treatment in the St. Pancras Infirmary. When the disease occurs around the anus, it gives rise to great pain during the action of the bowels, and frequently to spasm of the sphincter. In a case for which I was lately consulted, where the disease affected the prepuce, the aperture of this part was so much contracted and hardened by the cicatrices following upon the chaps, that not only had phymosis resulted, but the urethra was also considerably obstructed.

ERYTHEMA PAPULATUM.

268. Erythema papulatum (PLATE I., G.) is characterised by the development of numerous small red spots, of which the largest scarcely exceed the disk of a split pea. They are accompanied by considerable itching and tingling of the skin, which is increased after meals and during the night. On their first eruption the spots are of a bright red colour, and slightly raised above the surface of the surrounding skin. The swelling, however, subsides in the course of a few days, but the redness continues for one or two weeks, becoming

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[1] Intertrigo, a chafe-gall.

purplish in its tint, and yellowish as it fades away. In distribution the spots are irregular, being, in some situations, aggregated into thickly-set patches, while in others they are scattered and dispersed. This variety of erythema occurs most frequently on the face and neck, the chest, the arms, and the backs of the hands and fingers. It is met with at all periods of life, particularly in young persons and females, is preceded by febrile symptoms of an acute kind, and is usually associated with irritation of the gastro-pulmonary mucous membrane, and sometimes with rheumatism.

ERYTHEMA TUBEROSUM.

269. Erythema tuberosum (PLATE I., H.) consists of an eruption of patches of a circular form, and of a size varying between a fourpenny-piece and a shilling. They are frequently interspersed among the smaller spots of erythema papulatum, on the upper parts of the body; but upon the legs, where the eruption is most frequent, they occur without admixture. Like erythema papulatum, the spots are preceded by itching and tingling; they appear generally at night, are brightly red and very tender at their first outbreak, become purplish in the course of two or three days, and assume the yellow and greenish tint of a bruise as they subside. The eruption is frequently ushered in with chills and feverish symptoms, and is accompanied in its course by debility, languor, and considerable constitutional disturbance. This form of erythema is frequently met with in female servants, particularly in those who have been recently transferred from the fresh air of the country to the confinement of London kitchens. It is seen also in persons of debilitated constitution, and, according to Mr. Corfe, is generally associated with disordered menstrual function.

ERYTHEMA NODOSUM.

270. Erythema nodosum (PLATE I., I.) is an inflammation of the skin occurring in oval patches, which vary in size, from half an inch to two or three inches in diameter, and are situated for the most part on the upper and lower extremities. The long diameter of the patch usually corresponds with that of the limb, but in several instances I have seen it occupy the opposite position, and two patches, one before and one behind, meeting by their extremities, have surrounded the leg as with a bracelet. The oval patches are slightly raised above the surrounding surface, the elevation increasing gradually towards the centre; they are hot, painful, and tender; of a bright red colour at their eruption, but change in the course of a few days to a purplish and livid tint, which becomes subsequently yellow and greenish, and has the appearance of an ordinary bruise. The inflammatory activity of the patches increases for several days, during which they are hard and painful; they then become softer to the touch, and by the eighth or tenth day have nearly subsided; terminating by a transient discoloration of the skin, and desquamation of the epiderma. Erythema nodosum is preceded by symptoms of general feverishness, such as headache, languor, chills, dry skin, quick pulse, white tongue, nausea, diminished secretions, &c., and disturbance of the digestive

organs, these symptoms diminishing on the appearance of the eruption. It has also been observed in connexion with rheumatism. This eruption attacks chiefly young persons and females, and those of a debilitated habit of body.

I consider erythema papulatum, tuberosum, and nodosum, so closely allied to each other, that, were it not for the fear of creating confusion, I should include them under the same name. The two former are commonly associated in the same patient, and I have more than once seen erythema papulatum on the face and hands, while erythema nodosum existed on the legs.

ERYTHEMA CHRONICUM.

271. Chronic erythema may occur upon any part of the body, as the consequence of local irritation; and in some situations from constitutional causes. Of the latter kind are those inflamed patches (fiery spots) which occasionally appear upon the face, and remain fixed for a considerable length of time—often for years. These are generally accompanied by some irregular state of the system that requires medication.

As the effect of local causes, chronic erythema not unfrequently breaks out upon the hands and feet; upon the ears and lips; around the nipples of nurses; upon the abdomen, from the distention of the skin caused by pregnancy or ascites, upon the vulva, the prepuce, the scrotum, and around the anus. The inflammation of the skin in chronic erythema generally proceeds to the formation of chaps and fissures of various extent; the disease is tardy in its course, and obstinate under treatment.

272. *Diagnosis.*—The diagnostic characters of erythema are, redness and heat of skin with but trifling swelling, the redness passing by degrees into a purple and livid tint, as the inflammatory excitement subsides. The absence of tumefaction, and distention of the subcutaneous areolar tissue, at once distinguish erythema from erysipelas.

Erythema fugax is distinguished from the other varieties principally by negative characters—namely, by the absence of those peculiarities which mark the rest. The redness is diffused, there is little swelling, the surface is dry and hot, and the inflammation evanescent.

Erythema circinnatum is remarkable for the annular form of its patches; it is distinguished from herpes circinnatus by the absence of vesicles, and from lepra in progress of cure by its general appearance, and by the previous history of the affection.

Erythema marginatum is recognised at an early stage by the annular form of the patches, and at a later period, by its abrupt and papulated border.

Erythema læve is characterized by its association with œdema of the subcutaneous areolar tissue.

Erythema intertrigo is distinguished from eczema by the absence of vesicles. The cause of intertrigo, again, is immediately obvious.

Erythema papulatum may be confounded with some forms of roseola, and particularly with urticaria, but careful examination enables us to distinguish several striking points of difference. Thus, roseola is accompanied by a greater degree of febrile excitement; while urticaria is more irregular and unsteady in its progress, and the itching is more pungent.

Erythema tuberculatum is distinguished by the circular red patches developed on the skin, and by the constitutional symptoms.

Erythema nodosum is so clearly characterized as to offer little room for confounding it with any other eruption. Roseola is that which approaches it most nearly. Erythema nodosum is distinguished from other cutaneous affections by the oval form of the patches, and by their general erythematous characters. It differs from roseola in the greater depth of its inflammation.

Erythema chronicum, in its various situations, may be confounded with chronic eczema and psoriasis, unless the distinguishing characters of these latter—namely, the vesicles and scales—be remembered.

273. *Causes.*—The proximate cause of erythema is congestion of the vascular rete of the derma, induced by local or by general causes. The varieties coming under each of these heads have been already specified. Erythema may also be induced by disorder of the digestive organs, from the use of improper food, or from taking irritating matters into the stomach, as copaiba. The peculiarities of colour observed in the disease under consideration are explained by reference to the general principles of inflammation. During the period of excitement, the blood is of a bright red colour; it courses rapidly through the part, and the vessels become dilated. After the subsidence of the excitation, the stream of blood flows languidly through the dilated vessels, and assumes the venous character in its course. Hence the bright red tint of the early periods of erythema, and its purplish and livid hue during the subsequent stages.

The exciting causes of erythema læve are, retarded venous circulation through the limb, and interference with the vascular distribution in the skin by œdematous distention of the subcutaneous areolar tissue, while its predisposing cause is very commonly gout.

274. *Prognosis.*—Erythema is for the most part a slight affection, and derives its chief importance from the disease with which it may chance to be associated, or from the nature of its cause. The duration of the acute varieties rarely extends to more than two or three weeks. Chronic erythemata speedily yield when the exciting cause is removed, and erythema læve, the most serious of the erythematous inflammations, when it occurs in old persons, is easily controlled by judicious treatment.

275. *Treatment.*—The principles of treatment of erythema resolve themselves into three indications;—1. To restore the altered functions of the system to healthy action. 2. To allay the local irritation. 3. To excite the nerves of the part to resume their normal tone, and the congested vessels their normal dimensions and functions.

The symptomatic varieties of erythema require to be treated through the disease upon which they are dependent. The method of treatment must consequently vary in relation to circumstances. In some instances, the antiphlogistic plan may be required, in others, the irritation of mucous tissues must be soothed, while in others, again, it may be necessary to excite counter-irritation at a distant part. With the latter view, aloes combined with myrrh will be found a useful remedy, particularly in females.

When the system is reduced, and the powers are enfeebled, tonic remedies are indicated; bitters combined with acids are of great service, together with an appropriate regimen and the judicious use of exercise.

Sponging the entire surface of the body with warm water and soap every day, or every other day, with occasional warm baths, and drying the skin thoroughly with a rough towel, will also be found useful. To this means may frequently be added, with great advantage, the friction on the unaffected skin of some stimulant spirit or liniment, such as a drachm of tincture of croton,[1] combined with one ounce of spirit of rosemary and three of rose-water; or two drachms of liquor ammoniæ fortior to aqua calcis and oleum olivæ optatum, two ounces each.

The local treatment should, according to circumstances, consist in evaporating lotions, water dressing, or warm fomentations. In the erythema fugax of the face and neck, cold cream, either alone or with the addition of liquor plumbi, will be found a grateful application.

For erythema læve, the general treatment must consist in the restoration of the secretions, in establishing the regularity of the digestive organs, and in the subsequent exhibition of tonics; with attention to diet. Where gout is suspected to be the cause of the disease, a warm antacid purgative, such as Gregory's powder, or a powder composed of rhubarb, soda, and calumba, with or without colchicum, or iodide of potassium, should be given twice or three times a day, and the juice of two or three lemons as a cooling drink. The local treatment demands rest, such a position of the limb as will assist the venous circulation as much as possible; evaporating lotions, or warm fomentations in the acute stage, succeeded, as soon as the inflammation has somewhat subsided, by inunction with the ceratum plumbi, or the oxide of zinc ointment, either alone or in combination with the liquor plumbi diacetatis, and by the application of a well-adjusted cotton bandage. Gentle frictions with camphorated spirits may be employed when the local excitement is reduced, and repeated night and morning at each application of a fresh bandage. The erythema accompanying anasarca is immediately relieved by position.

The excoriations of erythema intertrigo require to be kept perfectly clean, and free from the original cause of irritation. They should then be dusted with some absorbent powder, such as Fuller's earth, starch powder, oxide of zinc, &c., and washed with a lotion of chloride of lime. Erythema paratrimma is relieved by astringent applications, or by soap plaster spread upon wash leather.

Erythema papulatum, tuberosum, and nodosum, require antiphlogistic regimen, a brisk purgative of calomel and colocynth at the commencement, then tonics and the mineral acids.

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[1] The tincture of croton, a most valuable cutaneous stimulant, is made by adding four ounces of spirit of wine to one ounce of the bruised seeds of croton. It is ready for use at the end of a week.

Chronic erythemata are to be managed according to the general principles of treatment above detailed; the excitement of the affected part is to be reduced in the first instance by soothing applications, and then astringents and gentle stimulants are to be used. The *chapping of the hands* may be prevented and relieved by the use of a small quantity of honey, which should be rubbed into the inflamed part each time the hands have been washed, and then wiped off, so as to remove any stickiness that may remain. An ointment of oxide of zinc is also useful for the same purpose.

Erythema of the nipples (chapped nipples) is best relieved by the application of an ointment of nitrate of silver, containing from five to ten grains to the ounce, the tinctures of kino and catechu, infusion of oak bark or pomegranate, or lotion of chloride of lime. Other useful applications for chapped nipples are a powder consisting of equal parts of borax and powder of acacia, which should be dusted frequently upon the cracks and excoriated surface; and mucilage of acacia. The latter should be pencilled on the tender part immediately after suckling, and the nipple protected with a leaden shield or limpet shell. I have also seen great benefit result from the use of collodion, which, judiciously applied, and assisted by other means, will be found an invaluable remedy. Collodion is also the best defensive agent that we can employ for protecting the tender skin from the effects of pressure and moisture.

It is judicious, in most cases, to wean the infant, when the nipples are tender and chapped; but when weaning is objected to or inconvenient, a shield and teat should be applied, without interfering with the nitrate of silver ointment.

For erythemata of the vulva and anus, the most soothing applications are the superacetate of lead ointment, or the oxide of zinc ointment with liquor plumbi diacetatis. Over these an evaporating lotion may be used, if requisite; and when the acute stage is passed, the milder ointment may be replaced by the nitrate of mercury ointment, more or less diluted, as the feelings of the patient may direct. The nitrate of silver ointment is also found to be of great service in some instances.

Cases illustrative of Erythema.

276. *Erythema papulatum.*—A married lady, habitually dyspeptic, became overheated on the 16th of December, 1845; she was afterwards chilled by exposure to cold in an open carriage for some hours. At night she was feverish and restless.

Dec. 17th. Next day she felt unwell, with general *malaise* and lassitude; was exposed to cold as before. In the afternoon had nausea and chills. At dinner she partook of boiled beef, at all times an unpalatable dish to her, and suffered in the evening from nausea and headache. In the night she was awaked with intense nausea, but had no vomiting.

18th. Third day. Felt very unwell, nausea still continuing, with lassitude. A punctiform rash became perceptible on the backs of her hands and fingers; the rash was more vivid at night, and attended with considerable itching.

19th. Eruption increasing; affecting the elbows as well as the hands, and slightly the neck and face.

22d. Fifth day. Eruption at its height. On the elbows, the papulæ formed a patch of about the size of the palm of the hand; they were numerous on the fingers and backs of the hands, and few and scattered on the face, neck, and head. The greater number of the papulæ were hemispheroidal, slightly raised, of a vivid red colour, and equal in size to a split pea. Some were clustered into circular and oval groups of the size of a sixpence, and others were single and isolated. On the backs of the hands were spots of a larger size than those above mentioned, as large as a sixpence or shilling, (erythema tuberosum;) they increased in breadth by their border, which was prominent and papular, while the included area became pale and yellowish. The eruption was very tender to the touch.

23d. Sixth day. The symptoms of nausea and feverishness, which were slightly diminished on the appearance of the eruption, were now greatly relieved. The eruption was on the decline; the tenderness subsided; the redness diminished; and each little papula, as it gradually disappeared, formed a distinct ring of red, with a light yellowish area. Traces of the eruption lasted until the end of the second week.

277. *Erythema papulatum et nodosum.*—A widow, forty-five years of age, regular, had been suffering for four months with bronchitis. On the 1st of April, 1846, she had an eruption on the face, and then on the hands, of papulæ of a bright red colour, and accompanied by severe itching and tingling. These symptoms were much increased on taking fluids of any kind, particularly such as were warm, and they were greatly augmented by the warmth of bed. They were very tender to the touch, particularly around the finger nails. A few days after the disappearance of the eruption on the face, the large oval-shaped swelling (delineated in PLATE 7) made its appearance, attained its height on the second day, and declined on the fourth, leaving behind it a purplish and yellow stain, like that of a bruise. The constitutional symptoms preceding and accompanying this eruption were nausea, feverishness, and extreme lassitude. The languor with great depression of spirits continued until the termination of the disease.

278. *Erythema tuberosum.*—A young woman, aged twenty-two, enjoyed good health until nine months ago, when she obtained service in London as housemaid. Since this period she has suffered constant illness; sometimes her bowels were constipated, sometimes she had nausea, at other times cough; menstruation was disturbed, becoming scanty, and light-coloured; she had leucorrhœa, and copious deposits in her urine, with difficulty in passing it. In fact, all the mucous membranes in her body suffered more or less from disorder. Associated with these symptoms, she had a constant feeling of languor, loss of appetite, and indisposition to make any exertion. While in this state, she was seized (January 1846) with a dry, hard cough, ac-

companied with headache and the usual train of febrile symptoms; and a copious eruption of erythema tuberosum made its appearance on her fore-arms, knees, and legs. The majority of the spots were of the size of a shilling piece; they were distributed irregularly over the skin, and were very tender to the touch. On their first appearance they were vividly red, but soon became purplish and yellowish, and by the third or fourth day, were on the decline. This patient recovered at the end of three weeks; her treatment consisting in a smart purgative at first, followed by tonics and wine, and an occasional warm bath during her illness. The water-dressing was used to the seat of the eruption.

279. *Erythema læve of the ankle.*—A cook, forty years of age, after a week of unusual exertion, felt languid and ill, and was unable to walk, in consequence of pain and swelling in her right leg. Her pulse was quick; she had a dry, furred tongue, and headache. The affected leg was œdematous, particularly around the ankle. In the latter situation there was a broad and extensive patch of erythema læve. The veins of both limbs were varicose, but she had never before suffered from any affection of the legs. I ordered her to bed, gave her an active purgative with salines, had the leg supported on an inclined plane, the inflamed parts wetted with a layer of lint dipped in a saturnine and alcoholic lotion, and the whole of the lower leg enveloped in oiled silk. By the next morning the redness had diminished very considerably, and the œdema was much reduced. I then moistened the limb with camphorated spirit, and bandaged it firmly, from the foot upwards, to the lower part of the thigh, readjusting the bandage night and morning. From the first day of the application of the bandage she was enabled to walk, but in consequence of again over-exerting herself, and misapplying the bandage, which, after the first few days, I intrusted to herself, it was found necessary to confine her again to bed, where, in a short time, she recovered.

280. *Severe erythema læve of both legs.*—In the autumn of 1841, I was called, with my friend Mr. Coulson, to see a lady of advanced age affected with this disease. She was corpulent, of sedentary habits, had long suffered from œdema, and her present attack had lasted for several weeks, resisting the various modes of treatment which had been pursued. The skin of the entire surface of both legs was of a deep red tint, highly congested, and covered with a rough and exfoliating epiderma. Her tongue was foul, and her general health very much disturbed, so much so, indeed, that she was apprehensive for her life. For the purpose of relieving the congested state of the skin, we recommended free scarification with the point of a lancet, to be followed by fomentations and bandaging. To this, however, she stoutly objected. We then ordered strict attention to position, painting the surface with the tincture of iodine, and carefully adjusted compression by means of strips of soap plaster spread upon leather; the local treatment being assisted by an occasional aperient and tonics. In the course of a few weeks she had entirely recovered.

281. *Erythema læve, issuing in mortification and death.*—An aged woman complained of great pain and uneasiness in the left foot and ankle. There was a diffused patch of redness, with slight œdema, occupying the front of the ankle; and the dorsum of the foot. Her tongue was not much altered, but her pulse was quick. I directed her to remain in bed, and to apply fomentations to the limb, at the same time recommending her to the attention of a neighbouring medical friend. In a few days the part became discoloured, and sphacelus commenced, which extended rapidly up the limb as far as the groin. After death the whole of the arteries of the limb were found to be solidified by calcareous depositions, and some of the smaller vessels were completely obstructed.

CHAPTER IV.

EFFUSIVE INFLAMMATION OF THE DERMA.

282. Under the designation "effusive inflammation of the derma," I propose to consider those inflammations of that structure which are especially characterized by effusion of a serous fluid upon its surface; and the consequent elevation of the epiderma in the form of vesicles or blebs. When the history of these diseases is investigated, they are found to be susceptible of a natural arrangement into two groups, the one marked by diminution of the vital powers of the system—*asthenic;* and the other by increased energy of the nervous and vascular systems—*sthenic.* The former of these groups corresponds with the order Bullæ, the latter with the Vesiculæ of Willan; and the diseases respectively grouped under each are,—

Asthenic.	*Sthenic.*
Pemphigus.	Herpes.
Rupia.	Eczema.
	Sudamina.

283. The diseases composing the asthenic group agree in the characters of presenting vesicles of large size or bullæ, in the want of tone of the cutaneous tissues, and in a greater or less degree of debility of the vital powers. In these characters, as well as in the existence of bullæ, they are allied with erysipelas, and especially with the phlyctenoid variety. So great, indeed, is this resemblance, that Willan was led into the error of grouping erysipelas with pemphigus, under the order bullæ. Now, however, it is well known that the development of bullæ is only an occasional phenomenon of erysipelas, and that, in general characters, that disease corresponds with the inferior class of exanthemata.

284. Willan and his school, upon insufficient grounds, have con-

sidered the degrees of pemphigus as different diseases under the names of pemphigus and pompholyx. Such a subdivision is calculated to obscure, most unnecessarily, the characters of an important affection, and to lead to much practical inconvenience. The inaccuracy of this subdivision was perceived by Rayer, and I have followed in his steps in regarding the forms of pompholyx as varieties of pemphigus.

285. Rupia, as it is the last in the asthenic group, establishes, by some of its least important characters, a link of transition to the order vesiculæ. Thus we find that the bullæ of rupia are smaller than those of pemphigus, and, in point of size, are more nearly allied to those of herpes. In pursuance of this observation, Willan placed Rupia in his order Vesiculæ immediately after Herpes, but it was subsequently restored to its proper position by Biett. Indeed, the correspondence of the general characters of rupia with those of pemphigus are so intimate, that one of its varieties occupies almost a neutral place between the two diseases.

286. In the classification adopted in this work, I have very considerably curtailed the order vesiculæ of Willan. That author had assembled seven diseases under this head, but five of the number must necessarily be rejected in a natural classification. Of these are varicella and vaccinia, which, at the present day, are recognised as variolous affections. Rupia, as we have just seen, is a bullous disease; Miliaria I have treated as a consequence of disorder of the sudoriparous system; and Aphtha, his seventh genus, is a disease of the mucous membrane of the mouth, being very probably an eczema of that tissue. Rayer admits six genera into the order vesiculæ; but, for similar reasons to those which have guided me in objecting to Willan's arrangement, I have transferred three to more appropriate places—namely, Sudor miliaria, which originates in disorder of the sudoriparous system; Hydrargyria, which differs in no essential respect, saving its exciting cause, from eczema; and Scabies, which is an inflammation of the derma, of various character, excited by the presence of parasitic animalcules inhabiting the epiderma.

287. The contents of the large vesicles of the asthenic group of diseases comprised under the definition of this chapter, differ somewhat in composition. Both consist of an albuminous fluid,[1] transparent at first, but subsequently becoming more or less opaque and puriform. Sometimes the fluid presents a pinkish or purplish hue, in which case the colour is derived from a portion of the hæmatosin of the blood mingled with the effused fluid. But in the sthenic group the fluid of the vesicles contains fibrine, and approaches more nearly to liquor sanguinis, while the stratum which lies in contact with the derma becomes organized and transformed into a false membrane. This false membrane is especially seen in herpes zoster, and in eczema rubrum and impetiginodes.

288. The fluid of pemphigus has been made the subject of chemical

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[1] M. Gruby, of Vienna, who has directed his attention to the vegetable nature of the crusts of favus, remarks that he has discovered another plant in the bullæ of rupia.

analysis by Scherer.[1] It had a yellowish tint, an acid reaction, a specific gravity of 1018, and deposited a sediment composed of corpuscles, which Scherer states to have resembled mucus or pus-corpuscles, but which were probably newly formed epidermal cells (13.) On evaporation it gave forth an odour of acetic acid, and deposited a quantity of very white albumen on being heated. It contained no trace of urea. The analysis gave the following results:—

Water	940·0
Solid constituents	60·0
Fat containing cholesterin	2·6
Albumen, with earthy phosphates	48·0
Alcohol extract, with lactate of soda, and chlorides of sodium and potassium	6·5
A substance resembling ptyalin, soluble in water	1·9
Free acetic acid and corpuscles.	

In the same patient, five years afterwards, the proportions of water and solid constituents were 959.8, 40.2.

In certain vesicles on the abdomen, probably herpetic, from the quantity of albumen which they contain, the fluid contents, examined by Girardin, gave the following analysis:—

Water	939·500
Solid constituents	60·500
Albumen	49·200
Cholesterin	6.475
Alcohol extract	1·075
Phosphates of soda and lime, and chloride of sodium	3·750

PEMPHIGUS.

Syn. *Pompholyx.* *Pemphix.* *Fièvre bulleuse,* Fran. *Blasenausschlay.* *Wassenblasen,* Germ. *Pemphix.* Alibert.

289. Pemphigus[2] (Plate 8) is an eruption of bullæ of considerable size, appearing upon circular or oval erythematous patches, corresponding in diameter with, or a very little larger than, the bases of the bullæ. The bullæ arise in the course of a few hours; they vary in bulk from that of a split pea to that of one valve of a walnut-shell, and occasionally they increase to the size of a fowl's egg. On their first appearance they contain a transparent limpid or yellowish serum, which, in a short space of time, becomes pinkish, sanguineous, or turbid, and is eventually discharged by the rupture of the bulla, or desiccates into a thin dark-coloured crust. When the bulla bursts, which it generally does in one or two days, an excoriation corresponding with its base remains behind. The disease occurs usually in successive crops; in rare instances, only, simultaneously upon all parts of the body. It may be partial or general, and may be prolonged in duration from a few days to several months, and even years.

290. The numerous varieties[3] of pemphigus indicated by different

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[1] Dr. Day in Simon's Animal Chemistry.

[2] Der. πεμφιξ, a bubble; πομφολυξ, a water bubble.

[3] Pemphigus congenitus; p. infantilis; p. simultaneus; p. successivus; p. solitarius; p. confluens; p. acutus; p. chronicus; p. pyreticus; p. apyreticus.

authors may all be embraced in the consideration of its two degrees of inflammatory activity—viz., acute and chronic. The former of these degrees includes the pemphigus vulgaris, pompholyx benignus, and pompholyx solitarius of Willan, while the latter corresponds with the pompholyx diutinus of that author. The pemphigus infantilis of Willan is more properly referrible to rupia escharotica, and his pemphigus contagiosus appears to be based upon insufficient data.

PEMPHIGUS ACUTUS.

291. Pemphigus acutus (PLATE 8) is a rare form of cutaneous disease, attacking children and young persons chiefly, attended by a trifling or moderate degree of constitutional disturbance, and lasting for a short period.[1] The disease may be partial or general, disseminated or confluent, and it occurs for the most part in successive eruptions.

The constitutional symptoms of acute pemphigus may be slight, not exceeding a trifling degree of listlessness or languor, or they may be severe, consisting of chilliness and rigors, flushes of heat, pains in the head and limbs, thirst, loss of appetite, nausea, sore throat, pain at the epigastrium, quick, frequent pulse, and sometimes delirium. Irritation of the gastro-pulmonary, or of the urethro-sexual mucous membrane, is a frequent complication of the constitutional symptoms.

The milder series of the above detailed symptoms belong to the *pompholyx benignus* of Willan; the same mild constitutional affection, with sickness and languor, accompany his *pompholyx solitarius.*

The local symptoms consist in the appearance, on the second or third day, or at a later period from the commencement of the constitutional disorder, of small red spots, accompanied by itching, and a dry burning sensation. The spots speedily increase in size, and constitute circular erythematous patches, which vary in their degree of redness from a pale to a vivid tint. In the course of a few hours a vesicle rises in the middle of each patch, becomes rapidly distended with a limpid serum, and increases to the size of a hazel-nut, or of a large walnut. The bulla is of a circular or oval form, and frequently somewhat flattened at its summit. It usually corresponds very accurately in diameter with the breadth of the erythematous patch, which it then completely conceals; at other times it is somewhat smaller than the patch, and the latter shows around it as a narrow zone. Sometimes, again, the bulla is much smaller, and appears to be surrounded by a broad areola. The bullæ generally burst at the end of a day or two, and expose an excoriated surface, which secretes a serous fluid for a few days longer, and then becomes covered by a thin, yellowish scab, which gradually assumes a brown, and subsequently a black colour. When the rupture of the bullæ does not take place, the limpid and transparent fluid which they contain assumes a yellowish and amber tint; it then becomes turbid and opaque, diminishes in quantity by absorption and evaporation, and at the end of about a week dries up, forming a thin, dark-coloured scab. Occasionally the contents of the bullæ become pinkish or purplish, in place of yellowish and turbid; and when the local inflammation has been violent, they may even be mingled with lymph or pus. The scabs fall in the course of three weeks, leaving the skin beneath of a dusky red hue, but perfectly sound. The period of rupture of the bullæ is dependent in a great measure upon situation, and upon the greater thickness or thinness of the epiderma. The duration of the disease is regulated by the manner of its irruption; when the bullæ appear at once, the affection terminates in one or two weeks. When, however, they are developed, as usually happens, at successive periods, the disease is prolonged in a similar ratio, and may extend to three weeks or a month. In the progress of the cutaneous eruption, vesicles are not unfrequently observed upon the mucous membrane of the mouth.

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[1] Rayer relates a remarkable and interesting case of this affection, which was admitted into hospital on the 21st of August, and discharged cured on the 3d of September.

292. The urine, analyzed by Heller, in a case of severe pemphigus, which proved fatal, the patient being a woman forty years of age, was acid, and its specific gravity 1017·5. It deposited a light cloudy sediment of mucus with fat-globules, urate of ammonia and epithelium scales. His analysis is as follows:—

Water	955·80
Solid constituents	44·20
Urea	24·63
Uric acid	0·58
Extractive matters	11·79
Fixed salts	7·20

"Of the fixed salts the earthy phosphates were normal, the sulphates much increased, and the chloride of sodium proportionally diminished. The urea is considerably above the normal average."[1]

In the case of a little boy, affected with acute pemphigus, my brother, Dr. Marris Wilson, found the quantity of urine passed in the twenty-four hours much below the average—namely, about 12 ounces; its specific gravity high—namely, 1033; and its reaction powerfully acid. It was of a light colour, deposited on standing a light flocculent cloud containing minute crystals of oxalate of lime, and was loaded with urea. In a thousand parts the quantity of solid constituents was 76·89.[2]

293. In the exceedingly rare variety of pemphigus named by Willan *pompholyx solitarius*, the bulla attains the size of an orange, enlarging very rapidly, and containing several ounces of serous fluid. It is preceded by a disagreeable sensation of tingling and smarting, breaks in about forty-eight hours, and is succeeded by a superficial ulceration. At the end of one or two days after the disappearance of the first bulla, another rises in its vicinity, and pursues the same course as the preceding. In this way five or six bullæ may follow each other successively, extending the duration of the disease to eight or ten days. Willan remarks, with regard to pompholyx solitarius, that "it is a disease which rarely occurs, and seems only to affect women. I have seen three cases of it: in one, the left arm was affected; in the other two, the breasts. The excoriations occasioned pain and irrita-

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[1] Dr. Day, in Simon's Animal Chemistry.

[2] For the details of this case see Portraits of Diseases of the Skin; pemphigus acutus.

tion, with partial hardness in the substance of the breast." Biett met with a chronic variety of this disease.

Pemphigus may be complicated with herpes; indeed, the small bullæ of this disease bear considerable resemblance to the vesicles of herpes phlyctenodes, and the likeness to herpes is still further increased by the occasional appearance of the smaller bullæ of pemphigus, in the form of rings (PLATE 8, I.) It may also be complicated with prurigo; the latter occurs most frequently in old persons, and accompanies the chronic variety.

PEMPHIGUS CHRONICUS.

Pompholyx diutinus. Willan.

294. The chronic form of pemphigus is identical with the pompholyx diutinus of Willan. It is of more frequent occurrence than the acute variety, is tedious and painful in its course, always successive in its appearance, and takes place in persons of debilitated constitution, principally of the male sex, and in aged individuals. In its irruption it is either general or partial, and occasionally it makes its attacks at a particular season, for several consecutive years, appearing, for instance, in the autumn or winter, and declining in the spring. Sometimes it lasts continuously for years.[1]

The constitutional symptoms are very light as compared with pemphigus acutus. There is usually some degree of sickness of stomach, headache, and lassitude, which precede for several days the appearance of the eruption. And if the latter be severe, the constitutional symptoms are considerably augmented. The cutaneous disease is sometimes associated with aphthæ, with considerable gastro-intestinal irritation, with dysuria and hæmaturia, and in old persons it not unfrequently terminates fatally, in consequence of its complication with pulmonary disease, or with effusion into the serous cavities.

The local symptoms are ushered in by pricking and smarting of the skin, and by the eruption of a number of small reddish spots, upon which bullæ speedily appear. The bullæ increase in the course of a few hours to the size of a pea or a walnut, and sometimes they attain the magnitude of a fowl's egg. At the end of three or four days, some of the bullæ burst and discharge their contents, leaving behind them an angry-looking excoriation of the derma. In others the serous fluid becomes reddish and turbid, and decreases in quantity until it dries up, forming a dark-coloured scab, covered with the shrivelled epiderma. As one crop disappears another is produced, so that the disease may be observed in all its stages at the same moment, and may be prolonged for several months, or, with intervals, for years. Occasionally the bullæ are confluent, especially when they make their appearance, which is not frequently the case, on the face.

Chronic pemphigus is sometimes complicated with prurigo, particularly in old persons; this complication excites the most distressing irritation, and frequently causes a fatal termination.

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[1] Dr. Duchesne-Duparc relates that he saw, in St. Louis, a girl, eighteen years of age, of weakly constitution, who had never menstruated, and who had been affected with chronic pemphigus since the age of five years.

PEMPHIGUS CONTAGIOSUS.

295. Willan founds a contagious variety of pemphigus upon the description of an endemic disease, accompanied with bullæ, which raged in Switzerland in 1752, and which is recorded by Dr. Langhans. He also alludes, in support of this variety, to the bullæ of plague, and to those which are sometimes observed in the last stage of typhus fever. The contagious variety is far from being satisfactorily established.

296. *Diagnosis.*—Acute pemphigus, with its bullæ raised upon inflamed bases, bears some resemblance to erysipelas; but the number and small size of the erythematous patches of the former are easily distinguished from the extensively inflamed, the tumefied and painful surfaces presented by erysipelas. From rupia it is distinguished by the small size, the flatness, and rarity of the bullæ, the ulceration of the skin, and the thick and prominent scabs which characterize rupia.

The duration of the disease, with the exceeding mildness of the constitutional symptoms, are the principal characteristics of the chronic form of pemphigus.

297. *Causes.*—Acute pemphigus attacks children and young persons chiefly; occasionally it appears as a congenital affection, and is sometimes of hereditary origin. The season during which it is most prevalent is the summer. Its occasional causes are, teething, gastric, and intestinal irritation, excess in diet, deficient innervation, irritability of system, mental affections, amenorrhœa and dysmenorrhœa. It sometimes results from the constitutional irritation caused by the introduction of the vaccine virus into the system. It has also been observed as a complication of intermittent fever, and several instances are recorded of its occurrence as an epidemic affection. A variety named *pemphigus indicus* is described by Sauvages as a symptom of dysentery.

Chronic pemphigus affects principally aged persons, and adults with debilitated constitutions. It is also, but less frequently, met with in children. It appears usually in the autumn or winter season. The most fruitful causes of chronic pemphigus are those of a depressing kind, such as fatigue, anxiety, intemperate habits, bad food, chronic irritation of the gastro-pulmonary or genito-urinary mucous membrane, amenorrhœa, residence in damp and unhealthy situations, exposure to cold, and starvation, &c. I once saw the disease as a sequela of scarlatina. In those most liable to this affection, there is an habitual dryness of skin and deficiency of cutaneous secretion. Biett remarks that he has frequently found a fatty liver in persons who have died of chronic pemphigus.

Two cases that have recently come under my notice led me to believe that pemphigus may sometimes result from the inoculation of the system by some poisonous principle. One of these cases was that of a surgeon who, eighteen months previously, punctured his right hand with a lancet which had just been used for opening a thecal abscess. The arm became swollen as high as the axilla, and was three weeks before it got well. Between three and four weeks after the cure of his arm, a crop of pemphigus made its appearance on his left thigh and leg, and has continued to show itself from time to time up to the present period. The development of the bullæ is always preceded by a febrile attack; there is a scalding sensation in the skin, and the next morning a crop of bullæ, which have attained their full growth, are seen.

The second case was that of a girl, aged twenty-two, who "poisoned" her right hand, seven years ago, in cleaning brass with a red paste. Three or four days after the injury a number of ecchymosed spots and bladders made their appearance on her wrist and forearm, and have continued to trouble her until the present time.

298. *Prognosis.*—Pemphigus is dangerous in proportion to its complications, and to the constitutional disturbance of the system. The acute variety is of little importance, but the chronic affection is always obstinate, and sometimes fatal, particularly in old persons. The disease would appear to exert sometimes a beneficial effect upon the system; thus Rayer narrates that he "once saw a man who, after having had several attacks of hæmoptysis, became subject to chronic pemphigus of the legs, and from this period the bleeding from the lungs did not recur. The cure of pemphigus has, in some cases, been observed to be followed by various ill consequences."

I have seen several cases which have induced me to believe that the eruption of pemphigus is an effort of the system to rid itself of some morbid disposition. In this light I regard Dr. Burne's case (§ 301.) This impression would lead to the adoption of a different mode of treatment to that usually employed—viz., to one of general stimulation of the surface.

299. *Treatment.*—When the febrile symptoms are acute, it may be advantageous to remove a few ounces of blood from the arm, or deplete by means of leeches, following up this treatment with purgatives and antiphlogistic regimen. Such a plan, however, must be pursued guardedly, for the natural tendency of the disease is towards debility, and it will generally be found needful to have early recourse to tonics. Where the febrile symptoms are not active, purgatives and diluents will alone be required.

In the chronic forms of the disease, tonics must be employed at once, the best of them being acids and bark, the latter either in the form of tincture or quinine. A valuable remedy in pemphigus is the hydriodate of potass. In those cases in which the symptoms present obvious indications of diseased action in any of the organs or viscera, such disorder should be made the especial aim of our treatment. Thus, when the alimentary canal is in a state of irritation, that irritation must be calmed; when the mucous membrane of the bronchia is the seat of morbid action, counter-irritants must be applied to the chest, and such other means adopted as will relieve those symptoms; when the uterine function is disordered, ferruginous remedies must be administered, &c. Restlessness and pain will be quieted by opiates. In an obstinate case of pemphigus, Rayer had recourse to arseniate of soda in small doses; in similar cases, Fowler's solution will be found a useful remedy.

When there is reason to believe that the eruption is an effort on the part of nature to determine to the surface a morbid disposition, I should strongly recommend the employment of mustard baths to the entire surface of the skin, or a stimulating lotion or liniment of some kind, such as that of tincture of croton (page 198.) I have pursued this method with great advantage in several general cutaneous disorders which have appeared to me to have a similar origin, and I think that my professional brethren will agree with me that we are warranted in having recourse to such a mode of treatment in cases so generally fatal in their termination as chronic pemphigus, wherein our only mode of practice is to treat symptoms as they arise.

In treating the disease locally, the bullæ should be punctured, and the fluid gently pressed out so as to apply the cuticle to the surface of the derma. This is done with the view of preventing the spontaneous rupture of the blebs, and the excoriation which necessarily follows. Occasional warm baths will be found useful. Where the bullæ have burst, and excoriations remain, anodyne and emollient fomentations, weakly astringent lotions, or absorbent powders, such as starch powder, may be employed with advantage. In these excoriations, a solution of nitrate of silver, containing two grains of the salt to an ounce of water, will be found the best application to promote cure. Turner's cerate is also a useful remedy, as is the unguentum zinci, recommended by Dr. Winterbottom.

The diet requires to be regulated by the state of constitution of the patient; where the symptoms are febrile, milk diet is most advisable, but when tonics are indicated, the diet should be generous and nutritious. Wine or spirits form an admirable adjunct to the tonic treatment.

Cases illustrative of Pemphigus.

300. *Acute pemphigus,*[1] in a man 26 years of age, a rope-mat maker and hawker, a free drinker, under the care of Dr. Roots, in St. Thomas's Hospital, in August, 1829. Eruption of bullæ general over body and face; persistence by successive crops for thirty-two days; aphthous mouth; subacute gastritis induced by the administration of five minims of liquor arsenicalis with tincture of opium, every six hours for three days; restlessness; tremors; death in thirty-two days from the commencement of the attack. No appearances to account for death on post-mortem examination. "Dr. Roots was of opinion that it was caused by continued irritation, arising from the exposure of so large an excoriated surface, in the same manner as after an extensive burn."

301. *Chronic pemphigus*[2] from deficient food, in a woman 37 years of age; under the care of Dr. Burne, in the Westminster Hospital, in April, 1836. Menses regular; bowels confined; persistence of the bullæ for five weeks; sore throat; bullæ cured; bronchitis; diarrhœa; death in ten days from the disappearance of the bullæ, and within seven weeks from the commencement of the attack. On the post-mortem examination "the bronchial ramifications were found full of muco-purulent matter, evidently generated by the inflamed mucous membrane." "In the abdomen, a large track of the mucous lining

[1] Lancet, vol. i., 1829-30, p. 129.

[2] Lancet, vol. ii., 1835-36, p. 540.

of the small intestines, particularly the ileum, was inflamed, but no ulceration could be detected. The large intestines were much more slightly affected.

RUPIA.

Syn. *Atonic ulcers.* *Phlyzacia*, Alibert.

302. Rupia[1] (PLATE 8) may be regarded as a modification of pemphigus, developed in cachectic and debilitated constitutions. It is characterized by the eruption of small, flattened bullæ, which are few in number and dispersed, and are surrounded by a narrow zone of redness. The bullæ contain, in the first instance, a serous fluid, which speedily becomes purulent or sanguinolent, and concretes and desiccates into dark greenish or blackish, rough crusts. These crusts are variable in point of thickness, and the larger ones bear some resemblance to the shell of the oyster; whilst others are conical in their form, being thicker in the middle than at the circumference, and not unlike the shell of the limpet. When the crusts fall off, they leave behind them atonic ulcers of a circular form, and various depth, which secrete an abundant ichorous and fetid fluid, and are indisposed to heal. Rupia is tedious in its progress, and lasts for several weeks or months.

303. The varieties of rupia are founded on the extent and severity of the disease, and upon the thickness and form of the crust; they are three in number—

Rupia simplex,
" prominens,
" escharotica.

RUPIA SIMPLEX.

304. In rupia simplex, (PLATE 8, L. M. N.,) the bullæ arise without preceding inflammation. They are circular in form, flattened on their summit, and equal in diameter to a sixpenny or shilling piece. When first developed, they contain a transparent serous fluid, which soon becomes purulent, and gradually concretes and dries up. As the secretion dries, the epiderma around it shrivels, and eventually forms a brownish, wrinkled crust, somewhat like the outside of an oyster-shell. The crust is thickest in the middle, and is continuous at the circumference with the epiderma of the surrounding skin. It is thrown off after some days, and exposes a superficial ulcer, which may either heal quickly, or continue for several days longer. In the latter case, a new crust is formed by the desiccation of the secretion upon the surface of the ulcer, and a succession of crusts may in this way be produced. When the ulcer heals, its seat is indicated by a redness or lividity of the skin around the cicatrix, which endures for a considerable period. The more frequent situation of rupia simplex is the legs and the lower parts of the body.

RUPIA PROMINENS.

305. The prominent rupia (PLATE 8, O.) receives its designation from the projecting and conical form of the crusts which succeed the

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[1] Der. ῥύπος, sordes.

bullæ. The bullæ are of greater extent than in the simpler variety, and are followed by a troublesome ulcer of considerable depth.

Rupia prominens is preceded by several circumscribed patches of erythema, upon which the epiderma is raised slowly, and is distended with a turbid, dark-coloured fluid. The fluid soon becomes concreted, and gradually desiccates into a thick and wrinkled crust of a brownish-black colour. While the crust is proceeding towards completion, the erythema slowly extends its limits so as to form a narrow areola around the circumference of the crust. Upon this areola the epiderma is raised, and a fresh secretion of purulent fluid takes place beneath it, which increases the breadth of the crust. In this manner, by successive secretions, extending each time beyond the limits of the first formed scab, the crust is gradually enlarged at its base, and raised more and more above the surface, so as to assume the characteristic form of the limpet-shell. From its mode of growth, the crust appears to be formed of concentric layers, projecting one beyond the other, like tiles upon a house-top, and when it enlarges in breadth more than in height, it bears a close resemblance to the scaly shell of an oyster. The crust goes on increasing for several days, sometimes for a week, and then becomes stationary. In this state it remains for a variable period, being at one time easily detached, and at another firmly fixed. When detached, either spontaneously or by accident, it is found to conceal an ulcer of considerable depth, and of variable extent, being deep in proportion to the duration of the crust. The ulcer, when thus exposed, sometimes secretes a new crust, which grows thick by successive additions from beneath. At other times—and this is the more frequent course—the ulcer retains its open form, presenting a foul surface, thin, livid, or pale, and excavated edges, and an inflamed areola. The ulcer is exceedingly difficult to heal, and after the formation of a cicatrix, leaves a livid and purplish stain, which continues for many months.

This form of rupia occurs both on the upper and the lower limbs, but more frequently on the latter. The bullæ are two or three in number, and successive; usually, however, there is only one at its height, while another may be threatening to appear, or on the decline. Sometimes the bulla, instead of pursuing the tardy course described above, is developed quickly, and is filled with a limpid serum, which subsequently becomes opaque and purulent. In other instances, again, the inflammatory redness may be dissipated without the appearance of a bulla.

RUPIA ESCHAROTICA.

Syn. *Pemphigus infantilis*, Willan. *Pemphigus gangrenosus*, Stokes.

306. Rupia escharotica, in some of its characters, bears a close similarity to pemphigus, particularly in the absence of a thick and rugous crust; while in its chief feature, that of ulceration, it evidently belongs to the present class.

The disease consists in the formation of bullæ upon somewhat prominent and purplish or livid spots. The bullæ are smaller than in the preceding varieties; they are irregular in form, and flattened at the summit, and they contain a sanguinolent serous fluid, which becomes turbid and dark-coloured, or almost black. At this period, the bullæ are surrounded by a purplish areola formed by the circumference of the livid spot upon which they are developed. At a variable period after their distention, the bullæ burst, and leave at their bases unhealthy and excavated ulcers, which increase gradually in breadth and depth. The ulcers are painful, they are frequently covered with sloughs, they secrete a sanious and fetid pus, their borders are thin and inflamed, and they are slow and tedious in their cure. As soon as the ulcers have formed, other bullæ arise, and follow the same course with the preceding, and the disease generally terminates in the death of the patient, from excessive and continued irritation. This disease occurs chiefly upon the lower extremities, upon the trunk of the body, more particularly its anterior surface, upon the neck, and upon the scrotum or labia.

Rupia escharotica is accompanied by fever, sleeplessness, restlessness, and general disturbance of the nutritive functions.

307. Dr. Whitley Stokes, in a paper published in the Dublin Medical Essays for 1807, describes this disease as it makes its appearance in an epidemic form among children in Ireland, under the name of pemphigus gangrenosus. It is known in different counties of Ireland, under the names of *white blisters*, *eating hive*, and *burnt holes*. Sometimes the eruption is preceded by a livid suffusion of the skin; more frequently, in a state of perfect health, one or more vesicles somewhat larger than a small pox pustule appear, increase for two or three days, burst, and discharge a thin fluid having a disagreeable smell, limpid in most cases, sometimes whitish and sometimes yellowish. The sore left by the breaking of the vesicles is painful, discharges a thin, fetid, ichorous fluid, ulcerates and spreads quickly, the edges of the ulcer being livid. Dr. Stokes remarks that the unfavourable signs of the disease are the rapidity of extension of the sores, their abundant and highly fetid discharge, and the blackness which commences at the edges and spreads over the entire sore.

The parts chiefly attacked are the fold of the ears, the hands or feet, generative organs, breast, groins, abdomen, and inside of the mouth and lips. "If the sores are behind the ears, they destroy the connexion of the posterior cartilage with the cranium; they spread to the meatus auditorius, to the eyes, the sight of which seemed, in a few cases, to have been destroyed one or two days before death; and they sometimes extend to the vertex.

"The constitutional disturbance that accompanies this disease seems principally the effect of irritation. When the vesicles burst, the child begins to grow peevish and fretful, pale, loses its appetite, and the flesh becomes remarkably flabby. The periods of the disorder are not very regular; but it often happens about the eighth day, that the pulse sinks, the lividity spreads over the whole sore, the fœtor and discharge increase greatly." "Death takes place about the tenth or twelfth day, often preceded by convulsions, sometimes by extreme lividity."

308. *Diagnosis.*—The only cutaneous diseases with which rupia offers a probability of being confounded are, pemphigus and ecthyma. From the former it is distinguished by the smaller size and flatness

of its bullæ; by the turbid and sanguinolent contents of the bullæ, as contrasted with the generally limpid and transparent fluid of pemphigus; by the thick, rugous, and imbricated crusts; and by the ulcerations of various extent and depth.

Ecthyma differs from rupia in being a pustular disease from its first appearance; by the highly inflamed areola with which the pustules are surrounded; and by the hardness, the small size, the imbedded position, and the closer adherence, of the scabs of ecthyma.

309. *Cause.*—Rupia occurs in persons of cachectic and debilitated constitution, in those whose strength is reduced by illness, by want of food, want of clothing, want of cleanliness, intemperance, &c. Sometimes it appears as the sequela of scarlatina, rubeola, or variola. Rayer has observed it in association with purpura hæmorrhagica; and in the North, it is occasionally seen as a complication of scabies. Rupia is now and then met with in combination with ecthyma, to which it is supposed, by Bateman, Biett, and Plumbe, to bear considerable analogy.

Rupia escharotica is usually seen in weakly infants and in aged persons. In adults, it is sometimes found associated with chronic rheumatism and syphilis. Dr. Whitley Stokes remarks that the causes of this disease are obscure. It seems confined to children, and attacks the finest in preference; the children of the poor more frequently than those of the affluent; and those who live in damp situations seem more particularly subject to it than others. The disease is more prevalent in summer than in winter, and appears to be infectious, though obscurely so.

310. *Treatment.*—The most important indication to be fulfilled in the treatment of rupia, relates to the hygienic and dietetic management of the patient. The various exciting causes enumerated as giving origin to the cachectic state of constitution which favours the eruption, should be removed. Warm baths should be employed once or twice a week. The diet should be generous and nutritious. Tonic medicines should be exhibited; of which wine, bark, the mineral acids, and infusion of wormwood, or hops, are likely to prove most serviceable.

In treating the disease locally, it is advisable to puncture the bullæ early, and cover them with a piece of dry lint and a light bandage, or with the water dressing. If they exhibit no improvement under this treatment, recourse may be had to strapping with the isinglass plaster, or to various forms of stimulants, such as lime water, lotions of copper, alum, and zinc, nitrate of silver, nitric acid, &c., rest and position being rigidly enforced during the employment of these applications. Rayer recommends dusting the surface of the ulcers with cream of tartar. Biett speaks strongly in favour of an ointment of the proto-ioduret or deut-ioduret of mercury; the former, of the strength of a scruple to the ounce, and the latter, of twelve or fifteen grains. In a more than usually obstinate case, which came under my care a few years since, in the person of an undertaker's man, I succeeded in effecting the cure of an unhealthy ulcer of rupia upon the arm, by injecting a strong solution of alum beneath the edges, which were undermined to a very considerable extent.

In the epidemic rupia escharotica, Dr. Stokes recommends an ointment of scrophularia nodosa,[1] containing as much green vegetable matter as possible. He remarks that this is a traditional remedy, but he found it more successful than any other plan of treatment. The ointment should be warmed until it possesses the consistence of honey, and then laid on with a brush, and dressed with the same spread upon lint. The utmost gentleness should be used, and the dressing renewed every six hours. Where there is swelling of the surrounding parts, or when any powder has been previously used, he applies, in the first instance, a poultice of porter and oatmeal, or a carrot poultice in a state of fermentation.

Cases illustrative of Rupia.

311. *Rupia simplex.*—A young woman twenty years of age, brought up in the country, but latterly resident in London, was attacked with small-pox eight years ago; she was ill for three weeks, and has been subject ever since to eruptions on the skin occurring during the spring. Five years ago she suffered from amenorrhœa and ulcer of the leg; and two years since from acute rheumatism. In the month of August, 1845, a vesicular eruption, accompanied by symptoms of constitutional disorder, made its appearance on her legs and thighs; and the eruption gradually increased until the limbs became studded all over with dark-coloured crusts, which gave issue, whenever they were accidentally loosened, to an ichorous discharge and blood. Her skin was dry, shrivelled and covered with a furfuraceous desquamation, and gave forth a disagreeable odour whenever the bedclothes were raised. At the end of February, 1846, she sank from exhaustion, and died. For a week previously to her death she suffered an attack of bronchitis, to which she had been subject in association with previous illness from eruptions. There were no indications of disease of the lungs after death.

A somewhat similar case to this, but more severe in the cutaneous disease, a patient in the St. Pancras Infirmary, recovered upon being sent into the country.

312. *Rupia prominens,*[2] in a young woman, seventeen years of age, of full habit; under the care of Mr. Bransby Cooper, in Guy's Hospital, in April, 1828. The eruption commenced in the beginning of March, in the form of vesicles, which became larger in successive eruptions; the bullæ were situated upon all parts of the body, particularly the lower extremities; they were each surrounded by a slightly inflamed areola, and terminated in conical crusts. The eruption increased for ten weeks, then subsided, and disappeared altogether at the end of thirteen weeks. The treatment consisted of mercury and sarsaparilla.

313. *Rupia prominens,*[3] in a woman twenty-eight years of age, married, and the mother of several children, under the care of Mr. Key, in Guy's Hospital, in August, 1835. Previous health bad, cough with expectoration. The eruption appeared three weeks since, first

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[1] This ointment is made by stewing the small leaves of scrophularia in as small a quantity of unsalted butter as may be sufficient to prevent their scorching.

[2] Lancet, vol. ii., 1827-28.

[3] Lancet.

on legs, then thighs, then arms, then face, preceded by pains augmented by warmth; the trunk is free; bullæ flattened, containing a milky fluid, surrounded by a slightly inflamed areola; the bullæ terminate in irregular brown crusts, which are conical on the face: an offensive, thin, bloody ichor escapes from beneath the crusts. When these fall, foul, unhealthy ulcers are exposed. She is now labouring under extreme debility; has no rest, from the irritation excited by the disease; she is much emaciated; her pulse is small and quick; the catamenia are suppressed; alimentary mucous membrane easily excited, as shown by the violent action produced by two five-grain doses of mercury with chalk, taken for two nights. No improvement had taken place in her condition at the end of seven weeks from the commencement of the attack. Syphilis was suspected by Sir Astley Cooper to be the cause of this eruption.

HERPES.

Syn. *Tetter.* *Olophlyctide*, Alibert.—*Dartre*, Fran.—*Flechte*, Germ.

314. Herpes[1] (Plate 9) is a non-contagious affection of the skin, characterized by the eruption of clusters of globular vesicles upon inflamed patches of an irregular or rounded form, and of small extent. The eruption rarely presents any remarkable degree of severity; it is not usually accompanied by symptoms of constitutional disturbance; and it lasts for a brief period only; rarely longer than two or three weeks. Each vesicle runs a course of about ten days, and terminates either by absorption of its contents, by desiccation without rupture, or by rupture, and the formation of a thin, brownish scab, which speedily falls.

315. The varieties of herpes derive their designation either from the form and arrangement of the clusters, or from the locality of the affection. In reference to their general characters, these varieties admit of a natural division into two groups, a phlyctenoid group, and a circinnate group. The *phlyctenoid group* is characterized by the irregularity of form and distribution of the clusters of which it is composed; it is typified by the variety herpes phlyctenodes, and embraces all the local forms. The *circinnate group*, on the other hand, is remarkable for the circular arrangement or form of its clusters; hence, the herpes zoster consists of irregular clusters disposed in a circular form around the trunk of the body; herpes circinnatus is characterized by the disposition of individual vesicles in the form of a circle; and herpes iris presents the same peculiarity in the form of concentric circles. In a tabular plan, the varieties may be thus arranged:

1. *Phlyctenoid group.*
   H. phlyctenodes,
   " labialis,
   " nasalis,
   " palpebralis,
   " auricularis,
   " præputialis,
   " pudendalis.

2. *Circinnate group.*
   H. zoster,
   " circinnatus,
   " iris.

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[1] Der. ἕρπειν, to creep.

HERPES PHLYCTENODES.

Syn. *Herpes miliaris. Nirles. Olophlyctis miliaris.* Alibert.

316. The phlyctenoid variety of herpes (PLATE 9, B.) presents no regularity of form or of appearance; it may show itself upon any part of the cutaneous surface, or upon several regions at the same time, but is most commonly developed upon the upper parts of the body, as the face, neck, and arms, and less frequently upon the lower extremities. The vesicles are globular; they vary in size from a mere point to the bulk of a pea, and are produced in dense clusters upon an irregular or rounded patch, rarely larger than the palm of the hand. Frequently there are two or more of these patches. The eruption usually disappears at the end of a week; sometimes, however, it is prolonged by successive eruptions to two, and even to three weeks, the yellowish spots which it leaves behind continuing perceptible for as many months.

The eruption, in herpes phlyctenodes, is preceded by a sense of heat, tingling, and smarting; upon the portion of skin so affected, numerous minute red points are shortly perceptible. On the following day, the redness of the patch becomes general, and a great number of small globular vesicles, of various sizes, and distended with a limpid transparent serum, are developed. During the third day, the contents of the vesicles become turbid and lactescent, with here and there one which is sanguinolent; and on the fourth day, some few have a sero-purulent appearance. On the third and fourth days the vesicles begin to shrink, and on the succeeding days to form, with their contained secretion, thin, brownish scabs, which are thrown off by desquamation by the tenth or twelfth day, leaving for some days a redness and livor of surface which disappears only by degrees. The purulent vesicles are not unfrequently followed by small superficial ulcerations.

The local symptoms accompanying the eruption are, itching, pricking and smarting, and an intense burning heat, with frequently a deep-seated pain, all of which symptoms continue for a short time in a mitigated degree, after the subsidence of the eruption. Constitutional symptoms are very rarely present, and should they exist, are limited to some degree of languor, thirst, loss of appetite, and diminished secretions.

HERPES LABIALIS.

Syn. *Exanthema labiale. Hydroa febrile.* J. Franck. *Olophlyctis labialis.* Alibert.

317. Herpes labialis resembles herpes phlyctenodes in every respect, with the exception of situation. This eruption is preceded by itching, redness, swelling, heat, and painful tension of the lips, sometimes affecting the mucous membrane of the prolabium only, at other times the integument alone, and again, both the one and the other conjointly. The redness extends to a variable distance around the mouth, sometimes reaching to the nose, and less frequently to the cheeks and chin. On the second day from the appearance of the redness, and sometimes earlier, several crops of small round vesicles, five or six in number, are developed upon the inflamed surface.

Some of the vesicles, by their confluence, unite to form small cellular bullæ, of the size of a split pea. On the third and fourth days, the serous contents of the vesicles become turbid and lactescent, and subsequently sero-purulent. On the fifth or sixth day, a brownish crust is formed upon the affected surface by the desiccation of the vesicles and their contents; and on the eighth or tenth the crust falls. The formation of a crust may frequently be prevented, by carefully opening the vesicles as soon as formed, and by the application of a weak solution of sulphate of zinc in rose-water. When the crust is interfered with during its formation, and removed, a hardened scab is produced, which remains adherent for a much longer period than the natural crust. Herpes labialis is sometimes associated with aphthæ of the mouth.

HERPES PALPEBRALIS, NASALIS, ET AURICULARIS.

318. An eruption of globular vesicles identical with those of herpes labialis is sometimes developed upon the upper eyelid, along the borders of the alæ of the nose, or in the concha of the ear, in association with irritation or inflammation of the mucous membranes of the eye, the nares, and the external ear. The progress of the eruption is precisely similar to that of the preceding affection.

HERPES PRÆPUTIALIS.

319. Like herpes labialis, the present variety may affect either the mucous or cutaneous surface alone, or both conjointly. The disease in this situation appears under the form of one or more red and well-defined patches of about the size of a sixpence, upon which the globular vesicles of herpes are developed. On the cutaneous surface the vesicles pass mildly through their course; the fluid is frequently absorbed, either in its serous or sero-purulent state, or they form thin, brownish scabs, which desquamate at the end of a week or ten days.

On the mucous membrane the inflammation accompanying the eruption is somewhat more severe. The vesicles assume a larger size, become speedily lactescent and sero-purulent, and terminate in thin, brownish scabs. These are not unfrequently rubbed off previously to their natural desquamation, and leave behind them small excoriated surfaces, which might, by inattention, be mistaken for chancres.

The symptoms accompanying both of these forms of eruption are, heat, itching, and often a pricking sensation. The disease is dependent for its cause upon friction with the dress in persons of great susceptibility of skin; contact with discharges from the vagina; neglect of habits of cleanliness; and irritation of the genito-urinary mucous membrane. Herpes præputialis sometimes becomes chronic, and is then very difficult of cure.

In its excoriated state, as I have before remarked, this eruption offers some risk of being mistaken for chancre. But the superficial ulceration of herpes, the occurrence usually of several small ulcerations in a cluster, and the uniform level of the exposed surface, are characters which contrast very strongly with the chronic progress of chancre, its thickened and raised edges, and the whitish appearance of its surface, produced by a false membrane.

HERPES PUDENDALIS.

320. This affection presents all the characters of the preceding varieties, the vesicles appearing upon the integument and mucous membrane of the labia majora, or upon the internal surface of the vulva. In these situations, the eruption is often rendered obstinate by the continuance of irritation kept up by the secretions from the vagina.

2. *Circinnate Group.*

HERPES ZOSTER.

Syn. *Zona. Zoster. Cingulum. Ignis sacer. Zona ignea. Zona herpetica. Shingles. Der Gürtelausschlag*, Germ.

321. Herpes zoster, or shingles, (PLATE 9, A.—F.) is especially characterized by the arrangement of the inflamed patches with their clustered vesicles in the form of a half-zone,[1] which extends around some part of the trunk of the body, from the middle line in front to the middle line behind. The eruption usually occurs at about the middle of the trunk. When it is developed higher up, the patches take their course across the shoulder, and are frequently prolonged along the arm; and when it is situated in the lumbar region, they occasionally extend to the thigh and leg. In rare instances, the eruption is met with forming a half collar to the neck, or a demizone around the face or head; it has also been observed upon one side of the scrotum or penis. Sometimes it happens that the patches assume a longitudinal direction on the trunk, and this is their customary course on the limbs. Bateman noticed this arrangement as a variety, under the name of *herpes proserpens*. Herpes zoster occurs indiscriminately on either side of the body; by some authors it is stated that the eruption appears, for the most part, upon the right side, while others contend that the left is the most frequently affected; my own experience corresponds with the latter statement. It is an acute disease, lasting from one to three or four weeks.

Herpes zoster, in the manner and course of its eruption, is identical with the typical form, herpes phlyctenodes, but more severe in its symptoms. The patches by which it appears are of a vivid red colour, commencing usually at both extremities of the demizone, and proceeding outwards by successive eruptions, until they constitute, by their approximation, an irregular line. The first formed patches are larger than those which succeed. They are perfectly distinct from each other, being separated, to a greater or less extent, by interstices of sound integument. Shortly after the appearance of each patch, a number of small white and glistening prominences are seen upon its surface, which speedily assume the form of vesicles, and the latter go on increasing in size, until, at the end of three or four days, they attain the magnitude of small peas. The vesicles are developed in groups, consisting of considerable numbers upon each patch, and in some situations they become confluent, and resemble small bullæ. On their first eruption they are filled with transparent serum, which becomes turbid on the second and third day, and subsequently sero-purulent, or purulent in some, and of a purplish or blackish tint in others. On the fourth or fifth day, the vesicles begin to collapse and fade; they look wrinkled, and during the two following days dry up, with their contents, into small scabs, of a dark brown colour, which fall on the tenth or twelfth day, leaving behind them a redness of the skin, which slowly disappears. The vesicles are not unfrequently intermingled with true pustules.

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[1] An unfounded notion was prevalent among the older physicians, that if the zone encircled the entire body, the case would terminate fatally. Pliny, amongst others, refers to this prejudice.

This disease is greatly modified, as regards its termination, by the state of health and vigour of the patient. In young and healthy persons the contents of many of the vesicles are absorbed on the fifth or sixth day, and the affection terminates by desquamation. In weakly and old persons, on the contrary, the sero-pustules burst, and produce painful excoriations, or ulcerations, which are often long in healing. These unpleasant consequences are most frequent on the dorsal region of the trunk, from the friction and pressure to which the vesicles are subject in this situation during decubitus. Sometimes, also, in old persons, the disease terminates in gangrene of the integument.

The symptoms accompanying herpes zoster are, a pungent and burning heat at the commencement of the vesicular eruption, and a continuance of the pain, to a greater or less extent, throughout the course of the disease. Its invasion is not unfrequently indicated by acute pains, which seem to shoot through the chest and epigastrium; and by tumultuous action of the heart. The close of the affection is sometimes marked by severe, and often intense nervous pains, which continue for several weeks, or even months. The constitutional symptoms are for the most part slight, consisting of some degree of feverishness, quickened pulse, and gastro-intestinal irritation. In some cases, the latter symptom is remarkable for its severity, and, in rare instances, the eruption is preceded by a rigor.

The urinary secretion in herpes zoster has been made the subject of chemical examination by Heller.[1] In one case, that of a boy eight years of age, the urine was abundant, faintly alkaline, pale yellow, rather turbid, rapidly became putrid, and deposited crystals of ammoniaco-magnesian phosphate. Its specific gravity was 1014-1015. In a young man, aged nineteen, the urine was clear, became turbid in the course of twelve hours, and deposited crystals of ammoniaco-magnesian phosphate; specific gravity 1018. In a man, thirty-one years of age, in whom there was slight fever, the urinary secretion was suppressed, that which was examined being the first that had passed for twenty-four hours. It was strongly alkaline, and deposited a sediment of ammoniaco-magnesian phosphate and urate of ammonia. Its specific gravity was 1028.

The deductions resulting from the analyses of these three cases are,

[1] Dr. Day, in Simon's Animal Chemistry.

that there is:—"1. A marked increase of the chlorides and phosphates, and a corresponding diminution of the sulphates; 2. An excess of hydrochlorate of ammonia; 3. A large amount of fat; 4. A diminution in the amount of uric acid;" an increase only occurring when the disease is accompanied with fever. The presence of oxalate of lime may always be suspected in these cases.

HERPES CIRCINNATUS.

Syn. *Vesicular ringworm.*

322. Herpes circinnatus (PLATE 9, G.) is an eruption of vesicles, of small size and globular shape, upon patches of inflamed skin, which assume the form of a circular ring. The circles are of various size and breadth, rarely exceeding in diameter the palm of the hand, and they enclose an area of unaffected skin. They are of a vivid red colour, and the vesicles by which they are covered are exceedingly numerous and sometimes confluent. The patches run through their course in eight or ten days, but when the disease assumes a chronic character, and the circles are successive in their eruption, it may be prolonged for several weeks. This eruption appears upon all parts of the body, but is most frequently developed on the face, the neck, the breast, and the upper extremities.

Herpes circinnatus commences in the form of small circular or oval patches of vivid redness, which become pale in the centre while they increase in size by the circumference. The vesicles are developed near the outer margin of the patch; they are small and globular, and they run through the usual course of herpetic vesicles, becoming, at first, turbid and milky, and then desiccating into small thin scabs, which fall off in eight or ten days, the denuded surface of the skin retaining a red colour, which gradually subsides. The symptoms accompanying the eruption are, a slight pricking and smarting sensation, with some degree of itching.

When the attack is particularly slight, the vesicles are very small, and their contents are disposed of by absorption, the eruption in this case terminating by furfuraceous desquamation. In other cases, the central area is not wholly free from the influence of the inflammatory action, but desquamates with the circumferential ring.

HERPES IRIS.

Syn. *Rainbow ringworm.*

323. Herpes iris (PLATE 9, H.) is a very remarkable and rare variety of cutaneous affection. It is characterized by the eruption of vesicles, either singly or in small aggregated clusters, which are encircled by four or five rings, differing in shade of red, and supporting vesicles of great minuteness. The first ring from the centre is of a reddish-brown colour; the second is lighter in tint, elevated, and somewhat yellowish; the third is of a vivid red colour, and the fourth of a pinkish hue, subsiding gradually into the tint of the surrounding skin. When there are other circles, they present each a different shade of red, and the entire disk is about equal in size to the circumference of

a shilling.[1] The smaller vesicles are usually found only on the second and third rings; the first ring being the areola of the central vesicle. The eruption may appear on all parts of the body, but is most frequent on the face and hands, and around the joints. Its duration extends to ten or twelve days.

Herpes iris commences in the form of small patches of general redness, which speedily assume the appearance of concentric circles. In the course of the second day, a vesicle is developed in the centre of each patch, and around this other vesicles sometimes become clustered. On the third and fourth days, vesicles begin to be developed on the circular rings. The fluid contained in the central vesicle is at first transparent; on the third and fourth days it becomes turbid, the same change taking place at the same time in the other vesicles. The eruption usually terminates by the absorption of the fluid contained in the vesicles, and the formation of a slight desquamation. Sometimes the vesicles burst, and give rise to the production of small, thin, brownish scabs, which fall at the end of ten or twelve days.

This affection gives rise to but little constitutional disturbance, and not much local inconvenience. It is ordinarily limited to a few disks, but sometimes these are so numerous as to be distributed more or less closely over the entire body.

324. *Diagnosis.*—The globular form of the vesicles, their size, their number, their pearl-like lustre, their clustered arrangement, and the redness and isolation of the patches, are the chief pathognomonic characters of herpes, and serve to distinguish it from every other affection. The vesicles are too small to be mistaken for the bullæ of pemphigus, and they are larger and more prominent than the vesicles of eczema.

Herpes phlyctenodes and *zoster* are distinguished only by the arrangement of the inflamed patches. In the former they are distributed upon various parts of the body at the same time, while in the latter they are limited to a region. The vesicles of herpes zoster are larger than those of the other varieties of this genus; they are also more serious in their consequences.

Herpes circinnatus, from the peculiarity of its form, is liable to be confounded with erythema circinnatum, or with lepra in its decline. From the first it is not easily distinguished, unless one or more of its vesicles remain; from the second, the absence of a hard and an elevated border, the absence of similar patches on other parts of the body, the presence of, at least, one or two herpetic vesicles, and the speedy decline of the redness, serve to establish a difference.

Herpes iris bears resemblance to a variety of roseola with concentric rings. The diagnosis is, however, at once rendered evident by the absence of vesicles or their traces on the latter.

325. *Causes.*—Herpes occurs, for the most part, in young persons and females, and particularly in those who possess a delicate and irritable skin. The seasons in which the disease is most prevalent are,

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[1] Dr. Marshall Hall has given an excellent description of this disease in the Edinburgh Medical and Surgical Journal. He remarks that some of the patches attain the diameter of an inch, and that the central vesicle sometimes becomes developed to the size of a bulla, and obscures the concentric rings.

the spring, the summer, and the autumn. Herpes is very commonly dependent upon some disturbance of the digestive functions, or upon irritation of the respiratory mucous membrane, and may frequently be regarded as an effort of the system to eliminate some disposition to visceral disease. The ordinary exciting causes of the affection are, irregularities in diet, exposure to cold while the body is heated, coldness and dampness of the atmosphere, contact of local irritants, fatigue, moral emotions of a depressing kind, &c.

Herpes labialis not unfrequently results from the influence of cold, as in the transition from a warm atmosphere to a cold, sharp wind. It is also associated with gastro-pulmonary irritation, and frequently appears as a critical sequela of fevers, catarrhs, and some affections of the viscera.

Herpes zoster frequently attacks adults and old persons, and in the latter is often a painful and distressing disease. In adults it has been observed to be more common in the male than in the female sex. The seasons most favourable to its appearance are the summer and autumn. Sometimes the affection would appear to be hereditary, and in certain seasons it has attacked so many persons as to give rise to the suspicion of its being an epidemic disorder. In rare instances, it has been observed as a critical eruption. I regard cold as its special cause.

Herpes circinnatus is sometimes seen to attack several members of the same family at the same time, or consecutively. This observation, however, merely points to a similarity of exciting cause, since various experiments have shown the impossibility of propagating the eruption by inoculation.

326. *Prognosis.*—Herpes, in young persons and in the adult, is a mild disease, and is important only in relation to the visceral affections with which it is concomitant, and of which it is frequently symptomatic; in old persons, however, it is serious, from the disposition to gangrene in the inflamed skin. As an illustration of the occurrence of this affection in a symptomatic form, I have preserved the notes of a case of partial herpes zoster, in which the eruption appeared upon the left shoulder, over the infraspinata fossa, in a young lady, sixteen years of age, in the spring of 1840. Upon examining her chest I found it to be small and contracted, and her respiration weakly, but she had no cough. I explained to her mother that the eruption was of little consequence, otherwise than as indication of susceptible lungs; that she must use the greatest precaution in protecting her from the influence of cold; and I gave her such hygienic instructions as I deemed best for the purpose of carrying out that object, ordering the frequent application of a counter-irritant to the chest and trunk, and the use of flannels next the skin. I heard no more of this young lady until the January following, when I visited her on her death-bed, at her particular request. She had fallen a victim to phthisis, and died a few days after my visit.

327. *Treatment.*—The treatment of herpes should be mildly antiphlogistic, and should consist of gentle laxatives, diaphoretics, and diluents, unless some visceral disorder be suspected, and call for especial attention. If the febrile symptoms run high, bleeding, either gene-

rally or locally, may be practised with advantage, more particularly in herpes zoster, in which this more active treatment is most likely to be demanded. The local management requires the aid of fomentations and emollients to relieve the local pain, unless contra-indicated by position or other circumstances. In most instances, a simple ointment will be found preferable to fomentations, especially when the vesicles are seated on parts of the body liable to friction or pressure. In the latter case, where some of the vesicles have burst, and the surface is bedewed with moisture, it may be dusted with starch powder with considerable advantage. When the eruption is evidently symptomatic, the indication offered by nature of the advantage of a counter-irritant should be carefully followed up. Herpes, on its subsidence, sometimes leaves behind it intense neuralgic pains which can alone be combated by sedatives. These after-pains are particularly characteristic of herpes zoster.

The treatment of the neuralgic after-pains of shingles often becomes a problem of extreme difficulty. In three cases of this kind, I found tincture of opium with tincture of aconite, rubbed into the painful part, procure relief; but in other cases I have failed. Nothing can be conceived more dreadful than these pains sometimes become: a gentleman whom I once asked to give me an idea, in words, of the nature of his suffering, replied, "You must fancy the marrow taken out of the bones of my arm, and a rough towel threaded through them; you must then imagine two devils at work with all their strength at each end of the towel, sawing it backwards and forwards; that is what it is like." In the region of the scapula, around the thorax, and around the abdomen, the pain is sometimes dreadfully severe. Dr. Ranking, in his excellent "Abstract," records the opinions of two gentlemen, Dr. Palmar and Mr. Humpage, on the treatment of this painful affection; the former recommends the application of the tincture of arnica, and the internal use of the oxide of silver; the latter proposes a blister followed by a belladonna plaster. Dr. Ranking himself suggests the endermic use of morphine, or electro-magnetism.

Herpes labialis is too slight to require remedial treatment; if, however, the heat, tension, and itching, are productive of much uneasiness, they may be relieved by a weak lotion of acetate of lead, or sulphate of zinc, or by an ointment containing a drachm of the liquor plumbi diacetatis to the ounce of elder-flower ointment.

The course of these vesicles, at an early stage, may frequently be arrested by the above lotions; when, however, the vesicles have formed, they may still be checked by puncturing them with a needle, and by inserting, for an instant, a fine point of nitrate of silver into the puncture.

The other local forms of herpes, including herpes præputialis, may be treated upon the principle recommended for herpes labialis.

In *herpes zoster*, when the patient is weakly or aged, tonic remedies and a generous diet will be required. He should be careful not to lie on the affected side, lest the vesicles be ruptured, and troublesome ulcerations or gangrenous sores produced.

When the vesicles are succeeded by excoriations or ulcerations, the ointment recommended for herpes labialis, spread upon lint, will be found a useful application. If the excoriations exhibit a tendency to gangrene, an ointment of nitrate of silver, containing ten grains of the salt to an ounce of simple cerate, should be used. And if the disease be accompanied by much pain, an ointment of opium, in the proportion of half a drachm of the watery extract to an ounce of simple cerate, will be found an advantageous remedy. My friend Mr. Lay, who suffered severely from the itching attendant upon this disorder, while engaged in Beechey's expedition, had recourse to a moist cloth which he found of great service in quelling that symptom when augmented so as to become unbearable by the warmth of bed. Lotions of sulphate of zinc, of super-sulphate of alumina, and subborate of soda, are recommended by Bateman for the same purpose.

The ectrotic treatment is applicable to herpes zoster, as well as to herpes labialis, and the other varieties of the eruption. The vesicles should be carefully punctured with a needle, and the sharp point of a pencil of nitrate of silver introduced, for an instant, into the opening. By this means the progress of the vesicles may be checked, and the cure brought more speedily about than by leaving the eruption to its course. In pursuing this plan, the possibility of some visceral disease should not be lost sight of; and as the cutaneous irritation will be diminished by the remedy, an artificial counter-irritant should be adopted in its place.

If any tardiness be apparent in the development of the eruption, the treatment suggested by Mr. Plumbe should be adopted—namely, the application of a strip of blistering plaster on the sound skin, in the situation where the vesicles are likely to appear, or immediately adjoining those which are already produced. This application has not only the effect of checking the extension of the disease, "but of producing a shrivelling of the vesicles already formed, and cutting short its progress altogether; avoiding at once its tediousness and all the pain attending it." Care must be taken not to apply the blister over the vesicles, for this is liable to give rise to sloughing of the derma. Moreover, Mr. Plumbe has remarked that blisters do not rise upon the inflamed patch of herpes.

Herpes circinnatus and *iris* require no especial remedies; they should be treated upon the general principles above indicated. When the circinnate variety becomes chronic, Gibert recommends an ointment composed of one drachm of sulphuret of lime, fifteen grains of camphor in powder, and one ounce of lard. If this ointment should fail, a blister will often succeed in putting a stop to the eruption.

Cases illustrative of Herpes.

328. *Herpes phlyctenodes.*—A boy, fifteen years of age, sat for some time on the grass, on Good Friday, April 10th, 1846. The next day he had severe pain over the whole of the front part of the right thigh, which was attributed to rheumatism. On the evening of Saturday, a blush of redness, in patches, was apparent on the surface. On Sunday, minute vesicles in clusters were perceived here and there upon the red patches. These vesicles soon became distended with a

transparent and colourless fluid, and reached their full size, looking towards evening like so many pearls. On Monday, some of the vesicles were already becoming shrivelled, and had a purplish hue, while others, fully distended, possessed a rich grape-yellow tint. On Tuesday, all the vesicles were on the decline, with the exception of a few tardy clusters, which were now attaining maturity. On Wednesday, the fourth day of the eruption, the greater part of the vesicles had dried up into reddish-yellow wrinkled scabs. On succeeding days the scabs became gradually darker and harder, and were closely imbedded in the skin. By Saturday, a few only of these scabs remained; and on Sunday, the completion of the week, traces only of the existence of the eruption remained.

329. *Herpes zoster, congenital.*[1]—A lad, nine years of age, had a severe attack, occupying the right half of the trunk, in April, 1827. The boy's grandfather had suffered from the affection several times. One of his uncles had the disease when a boy.

330. *Herpes præputialis with irritation of the mucous membrane of the bladder and urethra.*—Mr. B., a gentleman of about thirty years of age, who had resided for the greater part of his life in India, applied to me, during the summer of 1841, in consequence of a suspicion that he was affected with stricture. I found, however, that this was not the case, but that the mucous membrane of the urethra was exceedingly irritable. At one of his visits he showed me an eruption of vesicles of herpes upon the prepuce, at the same time telling me that he was liable to such attacks occasionally, but that they subsided in a few days, and were productive of temporary inconvenience only. He was in the habit of applying to them, when they appeared, a simple unguent, consisting of elder-flower ointment, and oxide of zinc, prescribed for him by Mr. Vincent.

ECZEMA.

Syn. *Humid tetter, or scall. Dartre squameuse humide,* Alibert.

331. Eczema[2] (PLATE 9) is a non-contagious affection of the skin, characterized by the eruption of minute vesicles in great numbers, and frequently confluent, upon a surface of irregular form, and usually of considerable extent. The vesicles are so closely aggregated in some situations, as to give rise to one continuous vesicle of great breadth. These larger vesicles, when laid open, appear to be cellular in their structure; the cellular disposition obviously depending upon the juxtaposition of the numerous small vesicles of which they are composed. The vesicles of eczema terminate by absorption of the fluid which they contain, or by rupture and moist excoriations, succeeded by thin crusts, and furfuraceous desquamation. The eruption is generally successive, and variable in its period of duration. It is not limited to the skin only, but frequently extends to the neighbouring mucous membrane. It is often developed on the scalp, and upon the hair-bearing parts of the body.

332. The varieties assumed by eczema, in its development upon

[1] Medical Gazette, vol. ii., p. 632.

[2] Der. εκζειν, to boil out.

the cutaneous surface, are divisible into two groups, *acute* and *chronic*. In the former are arranged four principal varieties, and in the latter one typical form. Besides these, several local forms of the disease, either from their severity, or from certain peculiarities which they present, deserve distinct consideration, and may be assembled into a third group, the members of that group being susceptible of assuming, as circumstances may direct, either the acute or the chronic type. The varieties of eczema, therefore, are,—

1. *Acute.*
E. simplex.
" rubrum.
" mercuriale.
" impetiginodes.

2. *Chronic.*
E. chronicum.

3. *Local forms.*
E. capitis.
" faciei.
" auriculare.
" mamillare.
" umbilicale.
" perineale.

ECZEMA SIMPLEX.

333. In this, the most simple form of eczema, (PLATE 9, I. I.) the vesicles, about the size of the head of a small pin, exceedingly numerous, and clustered into confluent patches of various extent, are accompanied by very trifling redness and inflammation of the skin.

The eruption makes its appearance suddenly, without premonitory symptoms, and the vesicles are distended with a transparent limpid serum, which gradually becomes turbid, and then milky. The fluid is then by degrees absorbed, and the epiderma shrivels into a thin pellicle, which is thrown off by desquamation. When, however, the vesicles are broken, as frequently occurs, the scale which follows is thicker and more adherent, and remains attached to the surface for a longer period. The affection is generally prolonged by successive eruptions for two or three, and sometimes for a greater number of weeks, but is so slight as to leave behind it no trace of the previous existence of morbid action. It is accompanied by itching, which is sometimes considerable and troublesome, but presents no constitutional symptoms. Rayer remarks that the vesicles "usually correspond with the minute projections whence the hairs issue, and which may be very distinctly seen by examining the insides of the arms and thighs with attention." This does not agree with my experience; they appear to me to occupy the interlinear compartments (§ 31) of the skin.

Eczema is sometimes general, but more frequently local, in its eruption. The parts of the body most liable to its attacks are the arms and forearms, and particularly the hands, and between the fingers. Rayer alludes to a variety of eczema simplex described by his pupil, Dr. Levain. This variety is "distinguished by clustered patches of vesicles, the dimensions of which vary from those of a sovereign to those of a two-sovereign piece." "The clusters are scattered over the skin, which only appears red in the places affected. On the red patches, covered with vesicles, the cuticle may sometimes be raised and removed in a single piece." From this description, it would seem that the eruption bears the same relation to eczema simplex that herpes phlyctenodes does to the local forms of that eruption.

I have observed another variety in which the vesicles were conical in form, and resembled those of scabies. They were dispersed singly and in small number over the hands and arms, and were each succeeded by a thin scale. Their elected seat was the thinly covered skin between the fingers, the flexures of the wrists, and the anterior surface of the forearm and elbow-joint.

ECZEMA RUBRUM.

334. Eczema rubrum, or inflammatory eczema, (PLATE 9, K. K.) is distinguished from the preceding variety by the development of the vesicles upon a surface which is tense, swollen, and of a vivid red colour. The eruption appears, in the first instance, in the form of minute white points, dispersed in great numbers over the inflamed surface. These speedily increase in size, and become small, transparent vesicles, filled with limpid serum, and surrounded by an areola of still deeper redness. When the disease is disposed to terminate favourably, the redness subsides at the end of a few days or of a week, the fluid contained within the vesicles is absorbed, and their epidermal parietes shrivel and dry up, forming thin scales, which are thrown off by desquamation, leaving behind them a redness of the skin, which continues for a considerable time.

When, however, the affection is more severe, the inflammation augments instead of diminishing, and the vesicles are produced in so great number as to become confluent. Their contents, at first limpid, become turbid and milky; they burst almost as soon as formed, and leave behind them inflamed and excoriated surfaces, which pour out an abundant secretion. The ichor from the inflamed surfaces is profuse and irritating, and serves to increase the extent of the excoriations. The exposed derma is of a bright crimson colour, and is covered here and there with flakes of a whitish membranous film. Some of these crimson excoriations are bordered by an abrupt margin of thick and softened epiderma. When the discharge diminishes in quantity, it concretes into the form of softish lamellæ, which harden by exposure to the atmosphere, and constitute scabs of various extent and thickness. The more severe degrees of eczema rubrum endure for two or three weeks, and if the causes continue which gave rise to the disease in the first instance, or if any source of irritation still remain, it may assume the chronic form.

ECZEMA MERCURIALE.

Syn. *Hydrargyria. Erythema mercuriale. Erythema ichorosum.* Marcet. *Mercurial lepra.* Moriarty.

335. Eczema mercuriale offers some points of dissimilarity from eczema rubrum, but not sufficient, in my opinion, to warrant its con-

sideration as a separate genus of vesicular disease, under the name assigned to it by Dr. Alley—*hydrargyria*. At the present day the eruption is rare; but formerly, when mercury was a fashionable remedy, its occurrence was more frequent. Dr. Alley describes three varieties, or rather degrees, of the affection—namely, hydrargyria mitis, febrilis, and maligna.

Eczema mercuriale is characterized by a red efflorescence occurring in patches of variable size, and surmounted by transparent vesicles of extreme minuteness. In the mild form of the affection, the vesicles are not perceived until the surface is examined with care, but in the more severe degrees the vesicles increase in size, and their transparent contents become opaque and purulent. In some instances, particularly where febrile symptoms are present, the efflorescence occupies a large extent of surface, sometimes the entire body, and assumes the appearance of rubeola; at a later period, the small semilunar spots coalesce, and form patches of larger size. The more usual seat of the eruption is the trunk of the body, or the thin skin of the pudendal region; sometimes it appears first on the backs of the hands, and more rarely on the face. The eruption is preceded by heat and smarting of the skin, and its progress is remarkable for excessive heat, with smarting and pruritus. When the vesicles are very minute, they dry up without giving rise to secondary inconvenience; but when they occur in folds of the skin, or are larger in size, they are usually broken, and the abraded derma pours out an acrid and offensive[1] ichor in considerable quantity. When the eruption declines—an event that usually happens at about the tenth or twelfth day in the mild form of the disease, and at a variable period later in the severe forms—the epiderma is thrown off by repeated desquamation, leaving the skin of a deeply red colour. Sometimes at the close of the eruption the disease concentrates itself on a particular spot, and remains obstinately fixed for weeks or even months. Of this kind is a case lately under my care, in which the congestion and epidermal exfoliation were limited to the palms of the hands.

Mercurial eczema, in its mildest form, may appear without constitutional symptoms, or with but trifling gastro-intestinal disturbance and feverishness. But in a more advanced degree,—in that, for instance, named *febrilis* by Dr. Alley,—the invasion is marked by rigors, nausea, pains in the head, diminished secretions, and other symptoms of severe constitutional disturbance. The fauces are always more or less inflamed in these cases, and the inflammation of the mucous membrane often extends to the bronchial tubes. In the most severe form of the affection—namely, in that produced by a continuance in the use of mercury after the eruption has appeared—the hydrargyria maligna of Dr. Alley—the face is enormously swollen, the eyelids closed, the throat tumefied and painful, the colour of the efflorescence of a deep purple colour, and all the symptoms aggravated. The epidermal exfoliation continues for a greater length of time; it is thrown off in large flakes, and the nails are sometimes cast with the epiderma.

Persons who have once suffered from eczema mercuriale are subject to subsequent attacks.

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[1] Spens compares it to putrid fish.

The mercurial eruption is sometimes the consequence of a long continued use of mercury, but occasionally it would seem to depend on a peculiar idiosyncrasy of the individual, unless we suppose the eyes of the observers to have become so obscured by a favourite hypothesis, as to see nothing but hydrargyria in every inflammatory eczema, developed after taking a dose of medicine containing a particle of mercury. This idea is naturally excited when we read of eczema mercuriale following the exhibition of a single blue pill, although I am quite ready to admit that mercury upon some constitutions possesses remarkable powers, and I have seen a man salivated from stopping his tooth with the metallic alloy commonly used for that purpose. At other times, mercurial inunction, or a mercurial atmosphere, is the cause of the eczematous eruption. Dr. Alley conceives that in his cases the effect of the mercurial ointment may have been much heightened by its admixture with camphor, the formula consisting of two scruples of the latter to an ounce of the unguent. Dr. Moriarty[1] assigns opium as a cause of this eruption. Indeed, the susceptibility of the skin after an attack is so great, that in Hewson Bigger's case it recurred several times under the use of opium. In Dr. Crawford's case,[2] the eruption was reproduced by one grain of opium. Cold, also, has had the effect of re-exciting it.

The treatment of eczema mercuriale consists in the removal of the cause, and the pursuance of the general plan laid down for the management of the milder forms of eczema simplex. Dr. Crawford found the liniment of oil and lime-water the best local application. Internally he gave tonics. Dr. Marcet's[3] case, which appears to have been simply eczema rubrum, following gonorrhœa, was treated with the warm bath, poultices moistened with liquor plumbi, and diaphoretic laxatives.[4]

ECZEMA IMPETIGINODES.

336. Eczema impetiginodes (PLATE 9, L. L.) is a severe degree of eczema rubrum; in some instances it presents all the characters of the latter at the outset, and subsequently assumes appearances peculiar to itself. At other times the disease breaks forth in all its severity on its first invasion. M. Devergie remarks that eczema takes on the impetiginous character in the proportion of thirty-five per cent.

In eczema impetiginodes the skin is highly inflamed and swollen; the vesicles, which are in many places aggregated into confluent clusters, often communicate with each other, and form a continuous vesicle of some extent. The contents of the vesicles, which are at first limpid, speedily become turbid and puriform, and in a short space of time are effused upon the surface by the rupture of the epiderma. The purulent secretion, after its effusion, concretes upon the broken surface, and produces yellowish, lamellated crusts, often of considerable extent. When the crusts are rubbed off, or removed, the exposed surface of the derma presents a vivid crimson colour, partly concealed here and there by films of whitish lymph, and secreting an abundant ichorous fluid, having a reddish tinge. This secretion hardens, if the inflamed surface be exposed to the influence of the atmosphere, into a thin, dark-coloured scab, which remains, unless disturbed by accident or design, until the excoriated surface is healed.

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[1] Edinburgh Medical and Surgical Journal, vol. xvi., p. 37.

[2] Idem.

[3] Medico-Chirurgical Transactions, vol. ii.

[4] The Edinburgh Medical and Surgical Journal contains other cases by Dr. Spens, vol. i.; *Dr.* MacMullin, vol. ii.; Dr. Rutter, vol. v.; and Dr. Ramsay, vol. vii.

The eruption of eczema impetiginodes, as of the milder forms of eczema, is successive; fresh crops of pustular vesicles are produced as the first decline, and in this way the disease is prolonged for two, three, or more weeks, especially if irritated by the employment of injudicious remedies. In the latter case the affection often lapses into the chronic form of eczema.

Eczema impetiginodes is for the most part local in its attack, confining itself to a single region of the body, and that of limited extent. The forearms and hands are the frequent seat of the disease, and the face is not uncommonly affected. In these cases, there are no constitutional symptoms. But when the disease is general in its eruption, or when children are the subjects of the partial affection in any degree of severity, the ordinary constitutional symptoms accompanying inflammation are developed—viz., quick circulation, excited nervous system, disordered digestive system, and diminished secretions. The local symptoms correspond in degree with the violence of the affection, consisting of burning and distressing heat, and excessive smarting and throbbing, which are greatly augmented by the warmth of bed, and tend to banish sleep.

ECZEMA CHRONICUM.

337. Whenever, from the continuance of any of the preceding forms of eczema for a lengthened period, either as a result of the severity of the original disease, or of mismanagement in its treatment, the surrounding skin is irritated by the ichorous discharge secreted by the excoriations, the deeper textures of the integument become more or less involved in the morbid action. The skin is inflamed and swollen, the subcutaneous areolar tissue becomes dense and infiltrated; new excoriations, with deep and extensive chaps and fissures, are produced, and a profuse ichorous secretion is poured out by the diseased structures. The chronic form of eczema is most frequently met with in the flexures of joints; more rarely it extends over a considerable surface, and occasionally involves an entire limb. It is obstinate and troublesome under treatment, and frequently, in defiance of the best directed management, endures for several months.

Sometimes the secretion diminishes in quantity, and concretes into thin, yellowish, lamellated scabs, which fall off from time to time, and are replaced by successive deposits of thinner scabs. The surface upon which they rest becomes less red and hot, and the diseased skin appears to be gradually progressing towards cure, when suddenly the redness and tumefaction return, a fresh crop of vesicles is produced, which burst and go through the usual course, but in a shorter space of time than the first. In this manner fresh and fresh crops are at intervals developed, and the morbid action is kept up for months, and even for years.

Chronic eczema is always attended with severe itching, which only increases with the attempts made by the patient to relieve himself by scratching. In certain situations, the pruritus is wholly unbearable, and excites the wildest paroxysms, as, for instance, when it occurs in the vulva, upon the scrotum, or around the anus.

ECZEMA CAPITIS.

Vesicular scall.

338. Eczema of the scalp is a frequent affection in infants at the breast, in children during dentition, and in those who are unhealthy and scrofulous at a later period. I have had occasion to observe this disease, on numerous occasions, among the ill-fed and poorly-clad children of workhouses. The disease may be limited to a part, or it may attack the whole of the scalp, from which it is liable to extend to the face, the ears and the neck. The scalp is red, swollen, and painful; the vesicles are produced in great numbers, and speedily burst, pouring forth an abundance of ichorous secretion, which collects around the hairs and involves them in a thick, lamellated, yellowish crust. The disease is attended with intense pruritus; it diffuses an offensive odour around the patient, and, if neglected, engenders pediculi in great numbers. It has been remarked by several authors, that the health of children affected with this disease is good; indeed, they affirm that it acts as a prophylactic against more serious disorders, and recommend that the discharge should be checked with caution. Rayer observes, that "those children who labour under eczema of the face and hairy scalp whilst they are teething rarely suffer from convulsions or obstinate diarrhœas."

If the disease be neglected,—and indeed sometimes when great watchfulness has been used in the treatment of the patient,—it is liable to fall into a chronic state. The scalp becomes thickened, and sometimes fissured; the lymphatic glands frequently become enlarged; subcutaneous abscesses occasionally form; the quantity of secretion is diminished, and the pruritus is not so great. The incrustations are lamellated in form, and dispersed among the hair in great abundance, assuming the characters which have been described by Alibert under the name of *teigne furfuracée.* At other times the secretion collects the hair into small bundles, and forms around them thin, shining, and silvery pellicles. Rayer compares these sheaths very aptly to the "pellicles that envelop the sprouting feathers of young birds." To the imaginative eye, the hairs, thus surrounded by thin, silvery pellicles, bear some resemblance to asbestos; hence the designation applied to this variety by Alibert, *teigne amiantacée.* Chronic eczema of the scab not unfrequently extends to the follicles of the hair, and destroys their function, producing partial alopecia. The destruction of the hair also takes place occasionally upon the eyebrows and eyelids.

ECZEMA FACIEI.

339. Eczema of the face is an affection of frequent occurrence in infants at the breast (hence it is sometimes confounded with crusta lactea) and young children, and is more rarely developed in the adult.

It is sometimes an extension of eczema capitis, but at other times appears primarily on the face, and especially upon the cheeks, the chin, the upper lip, and the forehead. The eruption invades, as in eczema rubrum, with a numerous cluster of minute and scarcely raised vesicles, which burst in a few days, and pour forth their serous or sero-purulent contents upon the inflamed surface. The eruption not unfrequently assumes the appearance of eczema impetiginodes, or partakes in some parts of the characters of that disease, while in others it retains the form of eczema rubrum. The effused secretion desiccates into thin, lamellated, yellowish and greenish scabs, which become more and more thickened by fresh addition of secretions from beneath, while the eruption extends by its circumference. In this manner the entire face may be covered by a thick, lamellated crust, which forms a complete mask to the features, not unlike that of the *porrigo larvalis* of Willan. The inflammation sometimes extends to the neighbouring mucous membranes, as to the conjunctiva, the Schneiderian membrane, or the membrane of the mouth. The affection is attended with considerable itching and smarting, and the skin becomes fissured with cracks induced by the movements of the face. The blood which escapes from these chaps, and from accidental scratches, mingles with the secretion from the excoriated surfaces, and tinges the crusts of a deep brown colour. When the disease declines, no trace of the affection remains; but if the face be scratched, as frequently occurs, in consequence of the intensity of the pruritus, unsightly scars are left behind. The affection occasionally spreads from the face to the rest of the body, and, if improperly treated, may endure for many months, or even years.

Eczema of the face sometimes merges into a chronic form; the vesicles cease to be produced, the secretion diminishes, the surface becomes dry and less red, a number of thin, grayish lamellæ usurp the place of the fallen crusts, and are succeeded in their turn by a furfuraceous desquamation. At a later period the skin may be left sound, but somewhat thickened, and of a deeper tint than natural, and the accustomed pale hue is regained only in the course of time.

ECZEMA AURIUM.

340. Eczema makes its attack upon the ears at all periods of life, and in both sexes, and is not unfrequently met with in children during dentition. The ears affected by this disease are red, swollen, and tender, and are covered by vesicles and chaps, which pour out a profusion of ichorus sero-purulent fluid. The discharge spreading upon the inflamed surface desiccates into a yellowish and brownish lamellated crust, which is constantly augmented by fresh secretion. From the pinna, the inflammation often extends into the meatus, and gives rise to great pain. Small subcutaneous abscesses form in the integument around the ears, and the neighbouring lymphatic glands frequently enlarge.

In children this affection generally terminates favourably, but in persons of more advanced life it is very apt to assume the chronic form. In the latter case vesicles cease to be produced, the incrustations become thinner, and are diminished; the tissues of the ear are swollen and infiltrated; the meatus is constricted, the skin is fissured by painful chaps, and the disease is exceedingly obstinate, often resisting every method of treatment, and enduring for years.

ECZEMA MAMMILLARUM.

341. Eczema of the nipples is a somewhat rare variety of eczematous affection, and usually assumes a chronic form. It has been occasionally observed in women during suckling, but is more frequently met with in girls at puberty, in women who have never been mothers, at the critical period of life, and in old persons. It is characterized by an eruption of small vesicles, succeeded by chaps, both the one and the other exuding a considerable quantity of secretion, which desiccates into lamellar scabs and scales. The affection is attended with much itching, and the nipple is tender, and frequently bleeds on being rubbed or scratched. In the chronic form the disease is exceedingly obstinate and difficult of cure. Should it occur during lactation, it is desirable that the infant should be weaned.

ECZEMA UMBILICALE.

342. In infants an eczematous eruption followed by excoriation and considerable discharge takes place around the umbilicus. The affection is of little importance, and soon yields to appropriate treatment.

ECZEMA PERINEALE.

343. In this affection, the eczematous eruption is developed upon the scrotum in the first instance, and thence extends to the neighbouring parts of the thighs, and to the anus; or it may commence in the latter situation, and spread to the scrotum. The disease, whatever its mode of origin, is exceedingly distressing, being accompanied by a most unbearable pruritus, which is increased, rather than mitigated, by the efforts of the patient to relieve himself by scratching. The vesicles burst or are ruptured as soon as formed, a large quantity of ichorous secretion is poured out, fissures and excoriations are formed, and life becomes a burden to the sufferer. Eczema in this region generally assumes the chronic form, and continues with temporary remission in the severity of the symptoms, for months and even years. It is generally met with in persons of the middle period of life.

In the female, eczema perineale is, if possible, more painful and distressing than in the male, and is much heightened by the extension of the eruption to the mucous membrane of the vulva. The irritation is, moreover, augmented by the frequent effusion of morbid secretions from the vagina. All the functions of the region are rendered painful, the smarting is excessive, and the pruritus unbearable. Adults are most frequently attacked with this disease, and children rarely. I have, however, seen one instance in a little girl eight years of age.

344. *Diagnosis.*—The different varieties of eczema present differences of character which are peculiar to themselves, and must be borne in mind in our endeavours to establish the diagnostic signs of

the disease. Thus, in eczema simplex we find clusters of minute vesicles in great numbers, and without accompanying redness; in eczema rubrum the vesicles are surrounded by inflamed areolæ of considerable extent, and mingled with moist excoriations; in eczema impetiginodes many of the vesicles contain a sero-purulent fluid, others are serous, and others, again, are supplanted by excoriated patches; in the latter stages of all the above varieties, we find lamellated scabs and incrustations of variable thickness; and in eczema chronicum we have chaps and fissures pouring out an abundance of ichorous fluid, and, at a later period, copious desquamation. Moreover, eczema is frequently seen as a complication of scabies, and is itself complicated by the pustules of impetigo and ecthyma.

Eczema simplex is not unfrequently confounded with scabies, and from the similarity of some of their characters, this mistake is very likely to occur. In both, vesicles are present; in both, the eruptions are developed without redness of the skin; both are situated in the flexures of joints, between the fingers, &c., and both are accompanied with pruritus. But, upon careful examination, considerable differences will be detected between the two diseases.

Simple eczema is likely to be confounded with sudamina, with which its vesicles bear considerable analogy. The characters by which it may be distinguished are, that in the latter the vesicles are of a larger size than those of eczema, being equal in bulk to a millet seed, while those of eczema rarely surpass the head of a small pin. The vesicles of sudamina are scattered and discreet, those of eczema confluent and very closely aggregated. The former, again, are associated with profuse perspiration, which is not the case with eczema. Moreover, sudamina occur without preceding irritation of the skin, and their presence gives rise to no abnormal sensations.

Eczema impetiginodes is liable to be mistaken for scabies and impetigo. Scabies complicated with pustules, as it sometimes occurs, presents several points of resemblance with eczema impetiginodes, but the other characteristic signs and the presence of a parasitic animalcule are absent. The pustules of scabies, again, contain pus from their first appearance. In impetigo, the pustules never contain serum; they are larger than the eczematous sero-pustules, uncomplicated with vesicles, which are always present in association with eczema impetiginodes, and confined to a small extent of surface. Again, the hardened coverings of the excoriations of eczema are thin scabs, while those of impetigo are dense and thick greenish-yellow or brownish crusts.

Eczema chronicum presents many points of resemblance with lichen agrius; for instance, the chaps and fissures, and the ichorous secretion from the excoriated surfaces. But the incrustations produced by the desiccation of the secretion are somewhat different in the two diseases; in the former they are thin, lamellar, and of considerable extent; in the latter they are smaller in breadth, thicker, and more yellow. But the principal difference is rendered apparent when the incrustations fall; for in eczema the surface is smooth, and somewhat tumid and shining, while in lichen it is rough and papular, the pimples being easily distinguished by the touch, if not at once detected by the eye. Moreover, the elementary characters of the two diseases are generally present in the neighbourhood of the eruption; in lichen some few papulæ may always be discovered, and in eczema, a few scattered vesicles may for the most part be found.

Chronic eczema may also be confounded with psoriasis, when the former ceases to exude any secretion, but upon careful inspection, a certain difference will always be observed between the lamellated scales which are produced by both affections. Those of psoriasis retain more of the characters of the epiderma than the incrustations of eczema. In other cases, however, it will be difficult to establish a positive diagnosis between the two diseases, unless a few elementary vesicles be found to confirm our decision.

Eczema capitis is sufficiently distinguished from other diseases of the scalp by the characters which have been already indicated in the description of this affection.

Eczema aurium is distinguished from erythema intertrigo by the absence of all trace of vesicles in the latter, and by its appearance in the cleft behind the ears. It is attended with chapping, and by the effusion of serous discharge. The same characters serve to establish the diagnosis between eczema mammillarum, umbilicale, and perineale, and erythema of those regions.

345. *Causes.*—Eczema is apt to occur either symptomatically, as a consequence of some constitutional disturbance, or as an effect of the application of local irritants to the surface of the skin. Of the former kind are the changes which take place in the system under hygienic influences, as during the spring and summer season of the year, particularly when accompanied by atmospheric vicissitudes; affections of the digestive system, as dentition; the irritation produced by unsound milk in infants at the breast; and stimulating and improper food and drinks in persons of all ages; affections of the uterine system, as amenorrhœa, dysmenorrhœa, utero-gestation, and the critical period of life; the cessation of lactation; affections of the nutritive system, as scrofula; and affections of the nervous system, as mental emotions, particularly of the depressing kind. The local causes of the disease are heat and cold, together with friction, and irritation of the skin produced by whatever cause. Thus, occasionally, we find eczema resulting from exposure to the sun's rays, a variety which has, by Willan, been denominated *eczema solare.* It not unfrequently attends the inflammation produced upon the skin by the irritation of a blister, or by the application of the compound sulphur ointment, or of a Burgundy pitch plaster. A variety is also met with affecting the hands of persons, who are called upon, in the ordinary occupation of life, to manipulate dry and powdery, or stimulating substances. In the same category must be enumerated the transmission of eczema, by contact, from one person to another, the discharge from the vesicles in this case not effecting any specific action, but merely acting the part of a local irritant. Eczema is developed in females more frequently than in males, an observation which must be referred for its explanation to the greater cutaneous susceptibility of

the former than of the latter sex. Again, different parts of the body exhibit a greater or less disposition to the invasion of the disease at different periods of life; hence it is well remarked by Rayer, that in "infancy and youth, eczema appears more particularly on the head; in riper years, on the breast and belly, but especially on the genital organs; and in advanced life, on the lower extremities, and about the margin of the anus." In some instances, the eruption has been observed to be hereditary in its origin, being developed in the infant soon after birth, and after the previous occurrence of the disorder in the parent.

346. *Prognosis.*—Eczema acts very commonly as a safety valve to the health of the system, and the discharge by which it is accompanied must be checked very guardedly, and not before a counter-action, either on the skin, or on the alimentary mucous membrane, has been established by art. In most instances, the eruption is difficult of cure, not so much from any pathological peculiarities which it presents, as from the circumstance of its being often symptomatic of constitutional disturbance or visceral disease, which must be removed before the local affection can be conquered; indeed, it usually happens, that the cure of the constitutional disorder is followed by a spontaneous disappearance of the eczema.

347. *Treatment.*—The treatment of eczema must be regulated by the severity of the symptoms, and by the particular causes of the affection. When the eruption is of idiopathic origin, the requisite treatment will be antiphlogistic; active when the disease is acute, as in eczema rubrum and eczema impetiginodes; moderate when the disease is mild, as in eczema simplex. In all the three varieties, and also in eczema chronicum, water-dressing, warm baths, and vapour baths will be found useful, and the regimen should be cooling and moderate. In the milder degrees of eczematous eruption, saline laxatives, with diluents and acidulated drinks, will generally suffice. In the more severe degrees, the abstraction of a small quantity of blood, with a more energetic aperient and diluent course, will be requisite. Whenever the disease is symptomatic in its origin, the treatment must be directed against the cause; for instance, in the case of disorder of the alimentary system, the remedies must be adapted to relieve irritation existing in the organs of that system; while the affection which originates in disordered uterine functions will demand the especial management of the uterine organs. When the constitutional powers are reduced, a tonic course and more generous regimen will be pursued with benefit. In the chronic form of eczema, when the disease is obstinate, and resists our common methods of treatment, it becomes necessary to modify the state of the constitution by various means; as, for instance, by a course of hydriodate of potash, of mercury, of Donovan's solution, of liquor arsenicalis, or of tincture of cantharides.[1]

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[1] In employing arsenic and cantharides as therapeutic agents, it will be necessary to watch their effects with care, and bear in mind the serious symptoms which may result from their abuse. Should any of these symptoms be apparent—namely, nervous disorder, and disorder of the alimentary canal, in the case of arsenic, or of the urinary system, in the case of cantharides, the medicines must be immediately laid aside, either

In treating the disease locally, if there be considerable redness and inflammation, blood may be abstracted from the part by leeches or puncture; the bleeding being subsequently encouraged by water-dressing, or by a poultice. The local warm bath and vapour bath will also be found of great service. When the severity of the inflammatory action is somewhat diminished by these means, the alkaline bath or warm sea-water bath may be employed, and a lotion of nitrate of silver, containing from two to ten grains to the ounce, applied twice or thrice in the day. In the interim of the employment of the baths, I have used the tincture of iodine pencilled on the part, or when this excited too much irritation, a liniment of lime-water and oil, either simple or with liquor plumbi, or the nitrate of silver. The remedies available in chronic eczema are, sulphuret of potash in lotion or ointment, lime-water, bichloride of mercury in weak solution, calamine ointment, zinc ointment, sulphate of copper ointment, tannin ointment, white precipitate ointment, red precipitate ointment, calomel ointment with watery extract of opium, carbonate of lead ointment, tar ointment, sulphur ointment, and mercurial ointment.

To relieve the pain and pruritus which accompany the eruption, the following remedies as local applications may be tried—viz., acidulated lotions, alkaline lotions, lotion of super-acetate of lead, emulsion of bitter almonds, or of hydrocyanic acid, lotions of opium or hyoscyamus, camphor mixture, infusion of dulcamara, &c.

When the eruption is of long standing, and there exists any reason for the belief that the arrest of the secretion would be attended with injury to the health, counter-irritation should be established either upon the trunk or limbs, or even on both. The best counter-irritants in these cases are the croton liniment (§ 275,) or spirituous or acetous infusions of horse-radish, or mustard. Rayer recommends issues and open blisters. In weakly constitutions, stimulating remedies are required; and in eczema of old standing, these applications must be powerful, in order to set up a new action in the part affected. With this view, I am in the constant habit of using a saturated solution of bichloride of mercury in proof spirit, applied upon the diseased part by means of a camel's hair pencil, or, what is preferable, the undiluted tincture of croton. Under certain circumstances, it is judicious not to attempt the cure of old-standing eczemas.

Two new medicines have lately been introduced in the treatment of chronic disorders of the skin, and particularly of chronic eczema; these are, Anthrakokali and Fuligokali.

348. Anthrakokali was introduced by Dr. Polya, of Pesth, about six years back, as a specific in certain diseases of the skin, and was made

permanently, or to be resumed after a few days, according to the judgment of the practitioner. Whenever we put a stop to the exhibition of arsenic, and return to it again, it is necessary to begin with a smaller dose than that at which we left off. Arsenic, when it acts upon the nervous system, performs the part of an alterative, but when its effects are directed upon the digestive system, it appears to me to act like cantharides, upon the mucous membrane of the kidney—viz., by counter-irritation, by exciting inflammatory action in the interior, and thus determining from the surface.

The best formula for the exhibition of cantharides is one in which it is combined with equal parts of compound tincture of camphor, and taken in tincture of cinchona.

the subject of a short treatise by Dr. Jacobovics. It was administered by Dr. Polya, as an internal medicine, and was especially employed against tettery affections, which this gentleman conceived to originate in a peculiar constitutional disorder. Anthrakokali, in the hands of Dr. Polya, produced the same specific effects, in relation to the tettery principle, that mercury effects in the case of syphilis, sulphur in the instance of scabies, and iodine in that of scrofula.

According to Dr. Polya, anthrakokali acts upon the entire system, producing a temporary increase of the local affection. It gives rise also to violent perspirations, and produces a general state of feverishness, under which the disease is cured. Thus it would appear, that by exciting a disease greater than that which it is employed to cure, it works its beneficial effects.

On the reputation which this substance obtained in the hands of Dr. Polya, Gibert made trial of it in St. Louis. Administered internally, he obtained none of the marked results described by its proposer; and after a fruitless experiment of several months' duration, gave it up as useless. Gibert next used anthrakokali as a local application, in the form of ointment; he found it less stimulant than the ordinary alkaline ointment; but yet sufficiently resolutive. As a general principle, he remarks, "the anthrakokali is a stimulant well suited to those cases in which we commonly employ sulphur and alkalies. It can only be used in the second stage of tettery affections—namely, that in which the acute period has yielded to the chronic state, the latter being, nevertheless, subject every now and then to re-excitement." For this reason, we find him lauding the effects of the anthrakokali, in a case of psoriasis inveterata, which had assumed an inflammatory activity under the use of an ointment of ioduret of ammonia. Thus, it would appear, that the anthrakokali deserves a place only among our more common stimulating applications, and is to be resorted to in cases where moderate stimulation is required, or where the morbid surface has become habituated to other forms of stimulant.

My own practice is a complete corroboration of the results obtained by Gibert. I have not ventured to use the remedy internally, after perusing the account given of its effects by Dr. Jacobovics, but I have found it an ordinary stimulant as a local application. An additional stimulant is, however, often of considerable value in our treatment, after we have employed without success the forms which we are most accustomed to prescribe. I have frequently observed a morbid surface, which has remained unchanged for weeks under the use of a given resolutive, suddenly assume a favourable aspect when treated by another with which the tissues are less familiar.

349. The mode of preparation of Anthrakokali is as follows:—

℞

Carbonate of potass	180 parts
Boiling water	2500 "

After the solution of the alkaline salt, add hydrate of lime, in sufficient proportion to leave the potass free. Filter the fluids, and evaporate in an iron vessel until the surface assumes the appearance of oil. Then add 150 parts of coal in fine powder, stirring it with the liquid until it be well mixed. The iron vessel is then to be removed from the fire, and the stirring is to be continued until the contents are converted into a black homogeneous powder. The anthrakokali should then be placed in well-stoppered bottles, in a dry place, in order to exclude moisture.

Dr. Polya also prepares a sulphuretted anthrakokali, by adding with the coal fifteen parts of sulphur, also in fine powder. This latter preparation is more active than the simple anthrakokali.

Anthrakokali is deliquescent, and very soluble in water. Its solution is of a deep brown colour, throwing down a black flaky precipitate with a mineral acid. The colour of the solution of the sulphuretted anthrakokali is blackish-green.

Dr. Polya asserts that the anthrakokali is a chemical compound of potass and coal, and that in the form of solution the latter is actually dissolved in the water. The test of this solution is the continuance of the fluid of its brown hue, without the occurrence of any precipitate. Gibert, however, denies this chemical combination, and regards it as a simple mechanical admixture. The coal, he says, separates from the fluid by precipitation, until the latter loses the whole of its colour, and none of the former remains behind.

Dr. Polya prescribes two grains of the powder, three or four times a day, in liquorice powder, or carbonate of magnesia. The ointment prepared by Gibert consists of fifteen grains of the anthrakokali to an ounce of lard. To be applied with or without friction, as the case may demand, twice in the day.

350. Soot has long enjoyed a reputation as a stimulant remedy in chronic diseases of the skin; it has for many years been used as a popular application in diseases of the scalp, and very recently has been recommended with much praise in the treatment of favus.

Fuligokali is a compound of soot and potass, in imitation of anthrakokali. It was first prepared by M. Deschamps, a chemist of Avallon, and has been made the subject of experiments, attended with considerable success, by M. Gibert, in Saint Louis. M. Gibert has employed the fuligokali both internally and externally, and finds it superior to anthrakokali. As an external application, in the form of ointment, it is resolutive, detersive, and stimulant.

The mode of preparation of the compound is the following:—

℞

Caustic potass	20 parts
Soot	100 "
Water	q. s. "

Boil the mixture for an hour; cool, filter, evaporate, and dry. The fuligokali is obtained in the form of scales or powder, and must be kept in well-stoppered bottles, in a dry place.

A sulphuretted fuligokali is obtained by the following process:—

℞

Soot	60 parts
Caustic potass	14 "
Sulphur	4 "

Heat the sulphur and potass with a little water, and after their solution, add the soot. Evaporate, dry, and close the resulting compound in well-stoppered bottles, and keep it in a dry place.

The ointment used by M. Gibert is composed of a scruple to half a drachm of the salt to an ounce of lard. In larger proportion it is highly irritating.

Soot is a substance which is variable in its composition, and must differ according to the circumstance of being procured from the combustion of wood or coal. Its principal constituents are—

Acetate, sulphate, and carbonate of lime,
Hydrochlorate of ammonia,
Chloride of sodium,
A brown, bitter, extractive matter,
An empyreumatic tar,
A bitter, volatile oil, possessing a strong odour of soot,
A fatty matter, containing oleic and stearic acid,
Carbon.

The potass solution dissolves the volatile principle of the soot, together with its aqueous extract. It contains, consequently, the active principles of that substance.

It is probable that both the anthrakokali and the fuligokali owe much of their therapeutic value to the alkali which forms their basis. I have employed the fuligokali in several cases, but place no confidence in it as a remedy.

SUDAMINA.

Syn. *Miliary vesicles. Miliaria. Miliary eruption. Hydroa.*

351. Sudamina are small prominent vesicles, of a rounded form, and about equal in size to millet seeds. They are transparent at first, and have a pinkish hue (miliaria rubra,) but at the end of twelve or twenty-four hours, they become opaque and milky (miliaria alba,) and resemble small pearls scattered on the skin. Their period of duration is three or four days; they then shrivel and dry up, and form thin scabs, which are thrown off by desquamation. By successive attacks, the eruption may be continued for several weeks.

Sudamina may be situated on any part of the body; their most frequent seat being the trunk, where they usually occupy a district of considerable extent. They are always discreet, though sometimes very numerous, are preceded by no signs, or by very little indication of cutaneous irritation, and by trifling redness of the skin.

Sudamina have received their name from being always associated with excessive heat of the skin, and often with profuse perspiration. Hence they are occasionally met with in eruptive fevers—namely, in rubeola, scarlatina, and variola. They also accompany simple, remittent, and typhoid fevers, and most inflammatory affections accompanied by profuse perspirations, as acute rheumatism. From the size which they usually present, namely, that of a millet seed, they have been termed *miliary vesicles*, hence the specific designation attached to certain diseases, as erythema miliare, implies a complication by these vesicles. Sudamina are most frequently observed in persons possessing a thin and irritable skin, and during the summer season.

852. Since the days of Sydenham, who advocated so powerfully the adoption of a cool temperature and cooling regimen in fevers, sudamina have become rare; but previously to his time they were exceedingly frequent, and from their connexion with fever were regarded as a specific disorder, preceded and accompanied by severe and dangerous fever. This fever was termed miliaria, and for many years was regarded as a dangerous and fatal disease, spreading like an epidemic, and destroying multitudes of lives. But, as I before remarked, since a more rational method of treatment has been employed in medicine, miliary fever has ceased to exist. Bateman remarks, "It is scarcely necessary now to enter into any detail of proofs, that the miliary eruption is the result of a highly heated and perspiring state of the skin, and that in its severe and fatal degree it is solely the effect of a stimulating regimen in a confined atmosphere. The almost total annihilation of the disease, of late years, since the general adoption of a better practice, is of itself unequivocal evidence of its origin." "Hippocrates, whose mode of treatment in febrile diseases was not calculated to produce excitement, has once or twice but casually mentioned the miliary eruption. And again, at the latter part of the seventeenth century, when, in the practice of the majority of physicians, the miliary fever was a frequent and fatal occurrence, Sydenham witnessed no such fever; but mentions the occasional appearance only of miliary vesicles, which he ascribes to their proper cause."[1]

"Among the various circumstances," continues Bateman, "under which the miliaria was formerly excited, the puerperal state appears to have been most frequently the source of it; insomuch that it was first described as an epidemic among puerperal women. This is sufficiently accounted for by the treatment which was unhappily pursued during the confinement after child-birth, and of which an impressive description is given by Mr. White. For not only was the mother immediately loaded with bed-clothes, from which she was not allowed to put out 'even her nose,' and supplied with heating liquors from the spout of a teapot; but to her room, heated by a crowd of visiters and a fire, all access of air was denied, even through a keyhole. From these causes fever was almost necessarily induced, with the most profuse sweats, oppression, anxiety, and fainting; and these again were aggravated by spicy caudles, spirits, opiates, and ammoniacal medicines. That numbers should perish under such management, with every symptom of malignity, and that many who survived it should escape with broken constitutions, will surprise no person who is acquainted with the baneful influence of over-excitement in febrile complaints."[2]

353. *Diagnosis.*—The diagnosis of miliary vesicles is not difficult; their being discreet, though numerous; their form and size; their occurrence chiefly on the trunk of the body; the absence of inflammatory redness of the skin; and their association with constitutional disease, and generally with a clinical state of the patient, sufficiently distinguish them from the smaller, itching and tingling, clustered, vesicles

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[1] Synopsis, edited by Dr. Thomson, p. 348.

[2] Opus cit., p. 350.

of eczema. The seat of eczema, again, is so different, and the inflammation of the skin which generally surrounds the vesicles. The vesicles of herpes are too large, and the inflammation at their base too conspicuous to be confounded with sudamina.

The *causes* of sudamina have been sufficiently indicated in the preceding description, and the *prognosis* must depend upon the disease with which they are associated, and of which they are simply symptomatic.

The *treatment*, again, applies to the fever which they accompany. The vesicles are too insignificant to call for the use of therapeutic measures.

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CHAPTER V.

SUPPURATIVE INFLAMMATION OF THE DERMA.

354. UNDER the influence of a degree of inflammation of the derma, for the most part greater, at least at its commencement, than that which exists in the effusive group of diseases, the inflamed derma gives rise to the formation of pus; the pus occupying the surface of the derma, and producing an elevation of the epiderma to a limited extent. This irregularity of the surface of the skin—namely, an elevation of the epiderma consequent on the presence of pus, is termed a *pustule*, and this is the only accurate sense in which that term can be employed. There is a wide distinction between a vesicle and a pustule, when these two pathological forms present their typical characters; but it not unfrequently happens, that in consequence of a reparative action set up in the vesicle, pus is produced upon its dermal base, and, mingling with the serum, constitutes a sero-purulent, and, subsequently, a purulent or pustular vesicle. In such a case it is necessary to remember that a true pustule contains pus from the first moment of its formation, and, by this circumstance, is essentially distinguished from a vesicle.

355. It is requisite, at the onset of our study of cutaneous diseases, to be most precise in our definitions, and to draw as broad a line as possible between the various pathological forms which we are desirous of characterizing. Scarcely any word in medical nomenclature has been used more loosely than the term pustule. At one time it was employed to signify a papula, at another a vesicle; and it was not until the time of the Linnæus of cutaneous pathology, that the proper application of the term was truly made. Willan employed it, with the characters above stated, as the type of his fifth order—*pustulæ;* and in this sense it has been subsequently adopted by successive dermatologists.

356. The diseases which I propose to consider under the definition above given, are two in number—namely,

Impetigo,
Ecthyma.

357. The order pustulæ of Willan embraces five diseases, two of which, had he lived at the present time, would, I am convinced, have been excluded by himself—namely, porrigo, and scabies. The genus porrigo of Willan contains diseases of the most opposite kind, and has been the source of much confusion, so much, indeed, that it would be well that the term should, for the future, become obsolete and forgotten. Scabies, again, is a disease possessing several elementary forms, of which both vesicles and pustules are accidental, and only occasionally present; the pustules, when they exist, belonging to ecthyma. Variola, as placed by Willan in the order pustulæ, is forcibly torn from all its natural affinities, and for this reason I have thought it correct to transfer the genus to the group of eruptive fevers. Rayer admits no less than ten genera of pustular inflammations, for four of which he is indebted to variola—namely, variola, varicella, vaccinia, and vaccinella. There could have been no objection to thus establishing a distinct group of variolous affections; indeed, some benefit might have flowed from such an arrangement, but the possible advantages are immediately destroyed by the companionship with which he has leagued them. Thus, from the highly inflammatory and contagious fever of variola, we pass on immediately to three forms of disease of the sebiparous glands—namely, rosacea, acne, and sycosis; next in order follows impetigo, then favus, a peculiar disease of the hair follicles, and lastly, ecthyma.

358. The genera impetigo and ecthyma constitute the two essential forms of pustules indicated by Willan—namely, psydracia and phlyzacia, the former being a psydracious (ψυχρα υδρακια, frigidæ guttulæ) pustule—that is, "a small pustule, often irregularly circumscribed, producing but a slight elevation of the cuticle, and terminating in a laminated scab. Many of the psydracia usually appear together, and become confluent; and, after the discharge of pus, they pour out a thin, watery humour, which frequently forms an irregular incrustation." The latter, a phlyzacious (φλυζειν, to be hot) pustule—that is, one, "commonly of a large size, raised on a hard, circular base, of a vivid red colour, and succeeded by a thick, hard, dark-coloured scab." The achor and the favus of Willan are no longer considered as pustules.

359. The transition, which I have already had occasion to remark, from erythema to pemphigus, and from rupia to herpes, may also be extended to pustulous affections. Eczema, in certain of its forms—as in the impetiginous variety—is seen gradually merging into impetigo, while ecthyma is farthest removed, both in position and characters, from the vesicular group.

IMPETIGO.

Syn. *Psydracia. Crusted tetter, or scall. Dartre crustacée*, Fran. *Kleienausatz*, Germ.—*Melitagra*, Alibert.

360. Impetigo[1] (PLATE 10, A.—F.) is a non-contagious inflammation of the skin, assuming usually a subacute type, and characterized by the eruption of small, hemispheroidal, or flattened pustules, with but little inflammation at their base. The pustules are for the most part arranged in thickly-set clusters, which occupy a small extent of surface; at other times they are distributed, more or less generally, over the surface of the body. Each pustule attains its full development, and bursts in the course of two or three days, terminating in a rough, yellowish, and transparent crust, of considerable thickness. The disease occurs frequently in successive crops, is attended with trifling or no constitutional symptoms, and endures from three or four weeks, to as many months, and even years.

361. The mode of distribution of the pustules has given rise to the division of the disease into two principal varieties—namely,

Impetigo figurata,
" sparsa.

To these have been added, by Willan, other varieties, respective of degree of severity or locality, which it would be more desirable to consider as subvarieties under the above heads; one of these, impetigo rodens, I omit altogether from consideration, since the disease described by Bateman under this name is evidently a venereal or malignant ulceration of the skin, and not an impetigo. The remaining varieties are—

Impetigo scabida,
" erysipelatodes,
" capitis.

IMPETIGO FIGURATA.

Syn. *Dartre crustacée flavescente.* Alibert.

362. This variety (PLATE 10, A. B.) is characterized by the occurrence of the eruption upon a distinctly circumscribed and defined spot, which is usually circular on the face and upper parts of the body, and oval on the lower extremities. The disease commences by the appearance of one or several small patches of redness, which remain distinct throughout the progress of the eruption, or subsequently unite with each other, and constitute a single patch; or it may appear at once as an inflamed patch of considerable size. Upon this inflamed patch a numerous crop of small yellow pustules are developed, which rise but slightly above the surface of the skin, and are collected into thickly set, and sometimes confluent clusters. At the end of one, two, or three days, the pustules burst and discharge their contents, and the effused fluid desiccates into thick, brittle, greenish-yellow coloured crusts, resembling a patch of dried honey. Beneath the

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[1] Impetigo, *ab impetu*, according to Pliny. Impetu agens.

crust the surface is red, inflamed, and excoriated, and pours out an abundant sero-purulent viscous secretion, which contributes still more to the thickness of the crust. Unless prolonged by successive eruptions, the crust falls off in from two to four weeks, leaving the surface beneath of a vivid red colour, somewhat swollen, exceedingly tender, and covered by a thin and shining epiderma. The surface is occasionally fissured by the movements of the part, and a secretion is poured out, which hardens into a thin secondary crust, and is followed by successive laminæ, formed in the same way. When the whole of the original patch is concealed by the kind of incrustation above described, the character of the disease may still be distinguished by a few scattered pustules, which always appear around the circumference of the crust. As the disease progresses towards cure, the sero-purulent secretion diminishes by degrees, and ultimately ceases; the crusts are no longer augmented in thickness; the secondary crusts, which have become progressively thinner, cease to be formed, and the skin, which is left red and congested, returns, after a certain space of time, to its original colour and pliancy.

Constitutional symptoms are either very slight in impetigo, being limited to some degree of lassitude and headache, or they are absent altogether. The local symptoms consist of heat and itching, which are much increased, and accompanied by a feeling of tension and smarting during the pustular stage. After the formation of the crusts these symptoms gradually subside, but the skin remains tender for some time after their fall, and very susceptible of a return of the eruption if exposed to fresh irritation.

Impetigo figurata presents various modifications in relation to the extent of surface affected, and the course of the disease. Sometimes it is confined to a very limited space, as to the middle of one cheek, the upper lip, the nose, or one or both eyelids, while, at other times, it fixes at once upon the entire face. Sometimes the eruption occupies a patch of small size in the first instance, while the disease spreads by its circumference, (*impetiginous ringworm,*) so as eventually to cover a large surface, whereof the centre presents the crusted stage of the affection, and the periphery its erythematous and pustular stages. The crusts again occasionally offer a peculiarity of appearance, being conical in their shape, and compared by Alibert to stalactites. This variety in form he terms *dartre crustacée stalactiforme;* it is most frequently seen upon the eyelids, borders of the eyebrows, nose, &c.; in brief, in any situation where the effused secretion has an inclination favourable to the gravitation of the fluid from the surface of the skin.

Instead of running through its course, and terminating by the restoration of the skin to soundness, within a moderate period, impetigo figurata is sometimes prolonged indefinitely by successive eruptions of pustules, each eruption pursuing the natural course of the typical affection. These successive attacks are occasioned either by a continuance of the original cause of the disorder, or by the employment of stimulating and irritating substances for its cure. In such cases the morbid action extends to the deeper tissues of the skin, producing thickening and condensation of the integument. Again, the eruption may occur periodically, appearing in the spring or autumn season, for several successive years.

The most frequent seat of impetigo figurata is the face, and more particularly the cheeks, but it may also occur upon the trunk of the body and extremities. The fore-arms I have remarked to be a very usual position of the eruption. It very commonly appears upon several regions at the same time, and there exists some little difference in regard to the form of the patch, according as it may be developed upon the upper or the lower extremities; thus, on the former, it approaches nearer to the circular, and on the latter to the oval shape.

363. Impetigo figurata sometimes assumes a *chronic* form; fresh crops of pustules are no longer produced, but the integument takes on a morbid action, it becomes thickened and infiltrated, and the excoriated surfaces pour out an abundance of viscous sero-purulent secretion, which continually desiccates into fresh incrustations, the incrustations being reproduced as often as they are rubbed or thrown off. Occasionally, the incrustations, instead of being thrown off, form a thick case upon the part affected, or around the limb, and constitute that variety which has been denominated by Willan *impetigo scabida*. A limb, surrounded by a case of incrustation of this kind, has been compared, very aptly, to the trunk of a tree covered with a rough and cracked bark.

IMPETIGO SPARSA.

Syn. *Scattered scall, or tetter.*

364. Impetigo sparsa (PLATE 10, C.) differs from impetigo figurata only in the more disseminated arrangement of the pustules. Instead of being confined, as in the latter, to a single spot or region, they are, in the *sprinkled* form, distributed over a considerable surface; for instance, over the entire limb, and sometimes over the whole body. The eruptive process pursues precisely the same course with that described as the typical form of the preceding variety; it is attended with considerable pruritus, and the pustules are successive, numbers being freshly developed in the midst of fully formed crusts. Impetigo sparsa usually appears on the limbs, especially upon the lower extremities, and about the ankles, and is frequently seen in the neighbourhood of joints. On the legs it is not unfrequently associated with œdema, and is exceedingly troublesome.

Impetigo sparsa is more apt to degenerate into the chronic form than the preceding variety. The surface beneath the crusts often presents superficial ulcerations, the integument becomes thickened and infiltrated, and the large collections of crusts constituting impetigo scabida are more frequently produced.

IMPETIGO SCABIDA.

365. Impetigo scabida (PLATE 10, F.) is merely that state of the two preceding varieties, in which the surface is covered by a thick incrustation, resembling the rough bark of a tree. This crust is broken and fissured from point to point by the movements of the part,

and through the apertures a quantity of sero-purulent secretion oozes to the surface, and desiccates upon the exterior of the crust. Sometimes impetigo scabida occurs upon the face, forming a complete mask to the features, but generally it is seen only on the limbs, and accompanies the chronic form of the eruption. It is attended with much pain in moving the limb, and by troublesome pruritus. When the crust is removed, the surface beneath is observed to be excoriated by superficial ulcerations, and fresh incrustations are speedily formed. Impetigo scabida is for the most part met with in old persons, and in those of debilitated constitution, and is not unfrequently associated with œdema.

IMPETIGO ERYSIPELATODES.

366. The ordinary forms of impetigo are characterized by the absence of constitutional symptoms, and by the moderate degree of inflammation which accompanies the local disease. Sometimes, however, the eruption is preceded by burning heat of surface, tension, great redness, tumefaction, in short, by the usual signs of erysipelas. To these are added, fever and considerable constitutional disturbance, the eruption appearing as usual, and running the same course. It is upon this combination of symptoms that Willan has bestowed the designation of impetigo erysipelatodes.

IMPETIGO CAPITIS.

Syn. *Impetigo lactantium. Crusta lactea. Tinea lactea. Porrigo larvalis. Porrigo favosa. Teigne muqueuse. Teigne granulée*, Alibert. *Milchgrind, Milchschorf*, Germ.

367. That affection of the face and head of young children termed milk-crust, or crusta lactea, and by Willan, porrigo larvalis, is an impetigo figurata, identical with the typical form of this disease, or if it be in any kind different, modified merely by the age of the patient, or by its more or less extensive occupation of the scalp and face. Crusta lactea presents several varieties in relation to degree of inflammation and thickness of crust; it may exist upon all parts of the head and face at the same time, or be located separately upon the face, the scalp, the ears, the temples, the alæ nasi, or the lips.

The pustules of crusta lactea, from exposure to the influence of the air, are somewhat whiter than those of impetigo developed on more protected parts of the body. They are accompanied by much itching, and are frequently broken by the action of the nails; the escape of pus and of the viscous sero-purulent fluid which succeeds giving rise to the characteristic greenish-yellow crusts of impetigo, and when, as frequently happens, the blood flows from the wounds caused by the nails, those parts of the crusts stained by the sanguinolent fluid assume a deep brown colour. When the wounds inflicted by the nails are deep, cicatrices are apt to remain after the subsidence of the disease, but, under ordinary circumstances, the skin is left perfectly free from any trace of morbid action. On the fall of the crust, the skin is red and congested, and covered by a thin and glossy epiderma; by degrees the natural hue of the integument is restored, and the epiderma, after repeated exfoliations, regains its normal appearance.

368. *Impetigo figurata of the scalp* (crusta lactea of the scalp) is modified in its characters by its development on the seat of the hair. The hairs are matted together by the sero-purulent discharge, and a thick yellow crust is formed, to which the matted hairs act the part of a felt. If this crust be allowed to remain, the morbid secretions collect beneath, and give forth a most offensive odour; the scalp is irritated and inflamed by its presence; pediculi are sometimes engendered in great numbers, and occasionally the hair falls with the crust, leaving the skin bald and thickened. Sometimes, as a consequence of this irritation, purulent collections are formed beneath the skin, and the lymphatic glands of the neck become enlarged.

The alopecia produced by impetigo differs materially from that occasioned by trichosis and favus; in the former, the ejectment of the hair is only temporary, the formative structure is not organically injured, and the hair is subsequently reproduced, of the same colour and with the same characters as the rest. Again, the patches are not regularly circumscribed nor perfectly denuded, as in trichosis and favus; on the contrary, they are uncertain in form, and some hairs still remain on various points of the alopeciated surface.

Impetigo of the scalp will last for months, and even for years, unless the crust be entirely removed, and the causes of irritation above alluded to prevented. When the inflamed skin is exposed at an early period, some few superficial ulcerations, from which an abundant secretion is poured out, are all that appears; at a later stage, however, the ulcers become large, and the deeper textures of the scalp are more or less involved.

The local symptoms accompanying impetigo capitis are, heat, pruritus, and more or less tension and pain. The constitutional symptoms are scarcely apparent, or very trifling, and when they exist, are frequently attributable to other causes, such as teething, &c., the period of dentition being that at which crusta lactea mostly appears. The eruption is occasionally vicarious of visceral disorder, and in this case requires to be watched with care during the progress of treatment. The pustules are sometimes intermingled with vesicles of eczema.

369. *Impetigo sparsa of the scalp*, (PLATE, 10, D. E.)—In certain instances, although these are rare as compared with the occurrence of the preceding affection, the pustules of impetigo assume upon the scalp the dispersed form of impetigo sparsa. The secretion from these pustules produces the agglutination of several hairs, and forms hard and irregular crusts of a brownish or grayish colour, which have been compared to small fragments of mortar imbedded among the hair. From these crusts, small particles or granules are frequently broken off, and are found interspersed between the hairs; hence the disease has been designated by Willan, porrigo granulata, and by Alibert, *teigne granulée*. Impetigo sparsa of the scalp, when neglected, gives rise to most of the inconveniences described under the head of impetigo figurata of the same region. The secretion becomes highly offensive; it acts as an additional cause of irritation to the cutaneous textures, and is the source of attraction to innumerable epizoa.

This disease occurs in young persons, and particularly in children: it is usually situated on the back part of the scalp, but sometimes affects the entire head. It is met with only in those whose constitution is enfeebled, and who are exposed to hygienic influences of an unhealthy kind.

370. *Diagnosis.*—The pathognomonic characters of impetigo are, the small size and little elevation of its psydracious pustules; the subsequent abundant viscous and yellowish secretion which the exposed surfaces pour out; and the thick yellowish green, or brownish and grayish, semi-transparent crusts. I have seen eczema impetiginodes mistaken for impetigo, but with the characters of the latter in the memory, it is scarcely possible to confound this disease with eczema. In eczema, the typical vesicles are always present on some part of the morbid surface, while its scabs are thin and lamellated.

When impetigo affects the chin only, it may be mistaken for sycosis, unless we recollect that in the latter eruption the pustules are larger, more prominent, discreet, less yellow in colour, and succeeded by less secretion. Moreover, the crusts of sycosis are darker in colour, less moistened by secretion, not renewed when they fall off, and accompanied by tubercles and indurations.

Impetigo of the scalp is distinguished from favus by the absence of the bright yellow cups, in addition to which, the loss of hair which accompanies the latter form of disease constitutes an important distinction.

The pustular forms of syphilitic disease may simulate impetigo, but in these cases, the livid or purplish stain of the skin, the dark colour of the crusts, and the deep and obstinate ulcers which follow, are peculiar to syphilis.

371. *Causes.*—Impetigo occurs in both sexes; at every age, and in all seasons; it is, however, more common in children than in the adult, and in women and persons having a thin and delicate skin, than in the male sex, and those whose skin is less susceptible. Impetigo figurata is most frequently met with in the spring season, while impetigo sparsa appears usually in the autumn, and in persons of adult and advanced age.

The disease is sometimes referrible to constitutional causes, as in those instances where it is found associated with the general disturbance produced by dentition, amenorrhœa, or by the cessation of the menstrual period. Its appearance seems influenced also by mental excitement, excess in diet or stimulating drinks, violent exercise, &c. It is very commonly met with in workhouses where a number of children of unhealthy constitution, poorly fed, and insufficiently clothed, are assembled together; and particularly where care is not bestowed upon the three great hygienic principles—ventilation, cleanliness, and exercise.

Local irritation of the skin is a frequent occasional cause, as in that produced by lichen, the application of stimulating substances to the cutaneous surface, such as dry powders, metallic dust, sugar, lime, &c., and the heat of the sun in the spring and summer season.

The impetigo capitis of infants, or the crusta lactea, is especially referrible to the irritation caused by teething, the disease occurring both at the first and second dentition. It is developed at this period in strong and healthy children, as well as in those who are weakly and scrofulous.

372. *Prognosis.*—Impetigo is an extremely troublesome and offensive disease, but by no means dangerous to life. It is frequently tedious of cure, especially when injudiciously treated, and by the improper use of remedial means may be prolonged indefinitely, or be made to assume the chronic form, which latter is always obstinate and rebellious.

373. *Treatment.*—In impetigo, unaccompanied by severe or extensive inflammation, emollient and sedative fomentations, the vapour bath, and water-dressing, are the proper applications. If the inflammatory action be greater, a few leeches may be applied with benefit, and if the inflammation be extensive as well as severe, general bleeding may be employed. If the above simple treatment fail in restoring the skin to its healthful condition, alkaline or sulphuro-alkaline or astringent lotions may be used, or any one of the following ointments—namely, oxide of zinc, calamine, acetate of lead, white precipitate, or dilute nitrate of mercury. Hydrocyanic acid, in the formula recommended by Dr. Thomson, is also a valuable remedy:—

℞. Hydrocyanic acid, ʒiv.
Acetate of lead, gr. xv.
Alcohol, ʒiv.
Water, ℥vij. M.

In the chronic form of impetigo, the vapour douche and bath will be found invaluable remedies; they soften and remove the crusts without exciting pain, and calm the irritation of the skin. After the entire separation of the crusts, the inflamed surface should be bathed with a weak alkaline or astringent lotion, and enveloped in oilskin, the vapour douche being repeated once or twice daily. Should the disease resist these measures, recourse may then be had, in turn, to lotions containing sulphuret of potash, nitric acid, or nitrate of silver. The ointment of the nitrate of mercury may in some cases be found useful. Creosote ointment, and zinc ointment, I have employed successfully after the local action has been reduced, and the system regulated. In very obstinate cases, arsenic, both as a general and local measure, has been recommended.

The constitutional treatment should consist in the restoration of any of the organic functions that may be disturbed. For this purpose, laxative medicines, antacids, emmenagogues, and tonics, may, according to the indications of the case, be employed.

In the treatment of crusta lactea, warm bathing and the vapour bath, with weakly alkaline fomentations, are the chief remedies. The other applications above recommended may also be used in a diluted form; and in strong and robust children it is often desirable to diminish the congestion of the skin by means of one or two leeches. The internal exhibition of laxative remedies, such as mercury with chalk and rhubarb, or rhubarb and magnesia, will also be found useful; and in most instances, when the infant is suckling, it will be proper to change the nurse, or wean the child. Rayer judiciously recommends, that where this disease depends obviously on dentition, and where the constitutional symptoms accompanying that state are relieved by its presence, we should be cautious in repressing the disorder, and confine our treatment to simple cleanliness.

In impetigo of the scalp, the hair should be cropped over the diseased parts, and the crusts completely removed by means of the vapour douche and water-dressing. The parts should be kept free from the irritation of fresh incrustations by frequent washing, and the same remedial means pursued as above recommended for impetigo in other parts of the body.

374. An incident which recently fell under my notice, speaks volumes with regard to the treatment of this disease. I had often occasion to observe with regret the utter uselessness of all medicinal applications in the treatment of these cases in the St. Pancras Infirmary, where numerous children are annually affected, and several are constantly in the sick wards. This want of success originated in the absence of proper nurses to carry out the directions of the surgeon. It was in vain that the necessity for cleanliness was urged upon them; they received little for their labours, and were not disposed to engage in a most disagreeable duty on philanthropic grounds alone. Under such circumstances, the pharmacopœia was exhausted of its specifics, but no advantages resulted. Things were in this state, and I had little hope of change, when, to my surprise and delight, I perceived the number of patients suddenly diminish, and those who remained looked cheerful and better in health. I inquired into the cause of this change, when I learned that a new nurse had been appointed to the charge of the children, and that she had set her shoulder vigorously to the wheel of these obstinate eruptions, and had turned out several cures. Upon asking her how she proceeded, she of course looked mysterious; but I quieted her fears of my perquisitions, by telling her that it was not her secret that I sought; that my object was simply to approve of her proceeding, and to urge her to its continuance. She said, in reply, that her treatment consisted in the application of a remedy derived from a "subscription" given to her mother by Sir Astley Cooper; that this legendary specific was a coarse admixture of "butter and pepper." For sound philosophy, this remedy,[1] in its modus operandi, is worthy of the celebrated name with which the female asclepiad had associated it, and I applauded its effects; it was an apt illustration of the sympathetic treatment of wounds by anointing the weapon with salves, and swathing it in bandages. But I reserved for myself that which my female co-labourer could not have comprehended—the perception of the benefit derivable from the thorough ablutions and rigid cleanliness with which the specific was accompanied.

ECTHYMA.

Syn. *Phlyzacia.* *Papulous scall.*

375. Ecthyma[2] (PLATE 10, H.—Q.) is an acute inflammation of the

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[1] An humble imitation of the unguentum piperis nigri, of the Dublin Pharmacopœia, formerly recommended for tinea and favus.

[2] Der. ἐκθύειν, to burst forth.

skin, characterized by the eruption of prominent pustules, of a rounded form and considerable size, upon any part of the surface of the body. The pustules are usually discreet, they are developed on a hard and inflamed base, and terminate in dark-coloured crusts, which leave a deeply congested surface on their fall, and sometimes a superficial ulcer, followed by a cicatrix. The eruption is for the most part partial and successive; in rare instances it is general; in the former case it may endure for one or two weeks; in the latter, for several months. It is not contagious.

376. Ecthyma is endowed by Willan with four varieties, having relation to the constitution and age of the patient; these are, ecthyma vulgare, ecthyma infantile, ecthyma luridum, and ecthyma cachecticum. I prefer, however, with Rayer, to consider the disease as presenting an acute and a chronic type; the former of these divisions corresponding with the ecthyma vulgare, and the latter embracing the three remaining varieties. In a tabular form, the varieties of ecthyma are,

$$\begin{array}{ll}\text{Ecthyma acutum seu vulgare.} & \\ \text{Ecthyma chronicum,} & \left\{\begin{array}{l}\text{E. infantile,}\\ \text{E. luridum,}\\ \text{E. cachecticum.}\end{array}\right.\end{array}$$

ECTHYMA ACUTUM SEU VULGARE.

377. This eruption (PLATE 10, H.—N.) is most frequently seen upon the extremities, often on the shoulders and neck, but rarely on the scalp. Its development is indicated by the appearance of small, red, and circumscribed spots, which gradually rise above the surface, are hard and painful to the touch, and increase to a variable size. Upon the summit of each of these conical elevations, a small quantity of puriform fluid is effused beneath the epiderma, and the matter continues to be augmented by additional secretion, until a pustule is formed. The size of the pustule is various; usually it is as large as the half of a pea, and surrounded by a hardened base of vivid redness, while at other times it covers the whole extent of the hardened base, and resembles a bulla distended with pus. The development and growth of the pustule is accompanied by severe pain, which is frequently of the lancinating kind. In the course of three or four days after the completion of the pustule, the contained fluid dries up into a dark-coloured scab of various thickness, which falls off in a few days, leaving behind a congested circular spot, of a deep red colour. Sometimes the purulent fluid is removed by absorption, and the surface of the skin is restored to its natural state, after repeated desquamation. At other times a superficial ulcer is formed, particularly on the lower extremities, and terminates with a slight cicatrix. When the eruption of pustules has been numerous, the congested spots left by the fall of the crusts present a remarkable appearance.

Rayer gives so excellent an account of the structure of the pustules, during their progressive development, that I am tempted to quote his words. "We find," writes this author,[1] "1. that in their first stage

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[1] Translation by Willis, second edition, p. 530.

(red elevations) there is merely sanguineous injection with conical tumefaction of the corion; 2. that in the apex, more rarely over the whole surface of the elevations, and under the cuticle, there is an effusion of a certain quantity of purulent serum; 3. that in the third stage, which follows immediately after, there is a kind of pseudo-membranous matter deposited in the centre of the elevation, which is now evidently perforated; 4. that after the voidance of this matter, and the removal of the cuticle, the pustule appears under the form of a cup-shaped cavity, surrounded by a hard, thick, puffed edge; 5. lastly, that on the following days this thickened margin subsides, at the same time that a slight cicatrix is formed under the crust, the centre of which is fixed within the point where the perforation has been observed.

ECTHYMA CHRONICUM.

378. Chronic ecthyma (PLATE 10, H.—Q.) is a more common form of disease than the acute variety; it occurs in successive eruptions, generally in persons of debilitated and cachectic habit, and is prolonged for several months.

When it appears in ill-fed, ill-clad, and weakly children, or in those who are debilitated from preceding disease, it constitutes that variety which has been designated by Willan, *ecthyma infantile*. This eruption is not unfrequently associated with irritation, or disease of the alimentary mucous membrane. The pustules are very dissimilar in point of size, some being small, and some large; they are circular in form, surrounded by an areola more or less inflamed, and terminate by absorption of the purulent fluid, and epidermal desquamation, or by ulceration. The ulcers in this disease are unhealthy, and difficult of cure.

In old persons, and in those who have injured their constitution by excess, the congested areolæ often present a purplish-red and livid colour; the pustules are of large size, and filled with a sanguinolent, puriform fluid, and they are remarkable for the tardiness of their course. This character of the eruption constitutes the *ecthyma luridum* (P. Q.) of Willan and Bateman.

In persons of unsound and cachectic constitution, of all ages, the cachectic form of eruption is developed. The pustules occur upon all parts of the body, but most frequently on the legs. The inflammation preceding the eruption is more extensive than in ecthyma acutum, and variable in degree. At the end of six or eight days, the epiderma is raised by the effusion of a small quantity of dark, sanguinolent pus, which forms by its increase an unhealthy and discoloured pustule. When the pustule is fully developed, the epiderma bursts, and the denuded surface becomes covered by a thick, dark-coloured crust, which appears enchased within the skin, and remains adherent for several weeks. If the crust be removed by accident or design, an ill-favoured ulcer with inflamed edges is exposed, which is tedious and difficult of cure.

The pustules of ecthyma are not unfrequently associated with scabies, lichen, prurigo, and some other chronic affections of the skin.

379. *Diagnosis.*—The large size and prominence of the pustules,

their inflamed bases, and the mode of their development, serve to distinguish ecthyma from all other pustular affections. When the pustules of acne and sycosis attain a large size, they bear some resemblance to ecthyma, but are easily distinguished by the broad and inflamed areola of the latter, and the hard, tubercle-like elevations without areolæ of both the former.

Syphilitic ecthyma is distinguished from the form at present under consideration, by the more chronic character of the eruption, the limited extent of the areola, its coppery hue, the blackness and concentric marking of the crust, and the presence of other signs of constitutional syphilis.

380. *Causes.*—Ecthyma may be developed at all periods of life, and at all seasons, but is principally observed in young persons and in the adult, and most frequently in the spring and autumn.

It may be excited by various stimuli applied to the surface of the skin, such as sugar, lime, salt, sulphur, &c. Grocers are liable to this eruption, from the irritation produced by the first of these substances, and bricklayers of the second. The manipulation of pulverulent substances of all kinds is apt to act as an exciting cause, and simple friction may give rise to the same consequences. The pustules following the irritation of tartarized antimony are ecthymatous; they are umbilicated, contain in their interior a false membrane, are very numerous, and succeeded by dark-coloured crusts.

Ecthyma is frequently excited by the irritation caused by other cutaneous diseases, as by variola, rubeola, scarlatina, herpes, prurigo, scabies, &c.

This eruption is often symptomatic of a disordered state of the system, as of some chronic affections of the viscera, or irritation of the gastro-intestinal, or uterine mucous membrane. It may also be induced by excess of mental or physical exertion, by bad and deficient food, want of proper clothing, residence in damp and unhealthy situations, want of cleanliness, debilitating causes of various kinds, excesses, and exposure to vicissitudes.

381. *Prognosis.*—The prognosis of ecthyma depends on the state of constitution of the patient rather than upon the eruption, which is in most cases an effect of disordered health. When the cause is external, and the form of the disease acute, the eruption seldom continues longer than two or three weeks; but the chronic affection may be prolonged for several months.

382. *Treatment.*—In the acute variety of ecthyma, after the removal of the cause, some gentle laxative and alterative medicine with diluents and abstemious regimen is all that will be required. The best local application is the superacetate of lead, or oxide of zinc ointment, or if the inflammation be severe, sedative and emollient fomentations and water-dressing.

When the disease is symptomatic of visceral disturbance, the treatment must be directed to the organ affected; the abstraction of blood is sometimes useful; tonic medicines, preparations of iron; abstinence from stimulating food or drinks; the cold or tepid bath, succeeded by friction on the sound integument, &c. I have employed the iodide of potassium with great benefit, in the bad state of health which accompanies ecthyma cachecticum. The ill-favoured ulcers sometimes left by the latter variety of the disease may be brought into good condition by water-dressing, and mild stimulants, such as a solution of the nitrate of silver, sulphate of zinc, supersulphate of alumina, chloride of lime, &c., or the weak nitric acid lotion, either with or without opium.

CHAPTER VI.

DEPOSITIVE INFLAMMATION OF THE DERMA.

383. By the term "depositive," which I have selected only in the absence of a more suitable word, I mean to express that condition of the inflamed membrane in which plastic lymph is exuded by the capillary rete into the tissue of the derma, so as to give rise to the production of small hard elevations of the skin, or pimples. In the preceding groups of diseases we have seen simple congestion of the papillæ of the derma, effusion of the serous portion of the blood on the surface of the derma, formation of pus on the surface of the derma; but in the alteration now under consideration there is no primary serous effusion, and no generation of pus. As far as my observation of the pathological characters of the present disease enables me to determine, there is capillary congestion and effusion of plastic lymph into the tissue of the derma, constituting a pimple of small size.[1]

384. The pathognomonic symptoms accompanying pimples correspond, moreover, with the supposition of such a pathological structure; they are accompanied by incessant itching, a sensation which may be explained by reference to the moderate degree of pressure produced upon the nervous plexus of the derma by the effused lymph, or, probably, by the distention of the neurilemma of the nerves by the more fluid parts of the lymph, so as to affect the nutrition of the nervous substance. Pruritus is unquestionably a degree of pain, but it is one of a mild kind, and such as we see for the most part in papular eruptions of the skin, or when the derma is returning to its natural state after inflammatory congestion of its tissue, or, again, when

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[1] [There has been much difference of opinion in regard to the pathological changes in a pimple or papula. Henle believes them to consist in an accumulation of inflammatory exudations in the papillæ of the skin. Rokitansky ascribes them to an inflammatory process, in which a product of inflammation is poured into the parenchyma of the corium, and into each of the papillary bodies, or into the deeper layers of the same. Rosenbaum, Lessing, Klenke and Hebra regard papulæ as originating in a morbid condition of the sebaceous glands. The researches of Simon accord greatly with those of Henle and Rokitansky; and lead him to believe that a papula is an inflammatory stasis in the vessels of the cutis, with an accumulation of fluid exudations in the tissue of that membrane. (Op. cit. s. 93.)]

foreign substances, such as scabs and crusts, effused fluids, parasitic animalcules, &c., lie in contact with the skin.

385. The diseases which are here characterized by the designation "Depositive inflammation of the derma," correspond with the order Papulæ, of Willan; and in this instance no difference of opinion exists among dermatologists as to the morbid affections admitted into the group. They are three in number—namely,

Strophulus. Lichen. Prurigo.

Rayer and Gibert remark that the above number might very properly be reduced to two; for that strophulus is nothing more than the lichen of young children and infants, while Alibert considers the whole under the single genus, Prurigo.

386. The definition given by Willan of the elementary form of papular affections admits of no improvement. A papula or pimple is "a very small and acuminated elevation of the cuticle (derma) with an inflamed base, very seldom containing a fluid, or suppurating, and commonly terminating in scurf." Papulæ terminate by resolution, generally with furfuraceous desquamation of the epiderma. The papulæ of strophulus have usually a greater elevation than those of lichen and prurigo. Some differences are perceived also in relation to colour; thus the pimples of strophulus may be either red or pale, those of lichen are always more or less red and inflamed, while the papulæ of prurigo scarcely differ in tint from the surrounding skin.

387. In the first edition of this work, I stated my belief that the precise element of the dermal system affected in the papular diseases was the papillæ of the skin. More recent and careful examinations have proved to me that this is not the case, but that the real seat of morbid change is the vascular boundary of the various excretory tubules of the skin; for example, the sudoriferous and sebiferous ducts, and hair-follicles. This fact being determined, we have an explanation of various of the phenomena which accompany the eruption; for example, the frequent perforation of the pimples by a hair, the formation of a thin scale upon the summit of the papule, the occasional appearance of a minute aperture in this situation, and the oozing of a transparent and colourless fluid from the same point. We can also better understand the provoking itching which is a symptom of the eruption, the obstruction which is offered to the escape of secretions, and the obstinacy of these disorders. The papulæ of prurigo are perfectly identical with the papulæ of lichen, the difference between them being, that the latter are generally acute in their course, while the former are always chronic. But there is an appearance of the skin in prurigo that must be familiar to all who are conversant with cutaneous diseases; an unevenness of surface, produced by numberless slight but broad elevations, separated from each other by the linear markings of the skin. Now these are the elevations which have been described by all dermatologists, not excluding myself, under the name of the broad and flat papulæ of prurigo. "Soft and smooth papulæ, somewhat larger and less accuminated than those of lichen, and seldom appearing red or inflamed, except from violent friction.

Hence an inattentive observer may overlook the papulæ altogether."[1] Rayer speaks of them as being "soft to the touch, and broader than those of lichen, from which they also differ in preserving the natural colour of the skin." "They occasionally project in so slight a degree, that they appear to be situated rather in the substance than on the surface of the skin." Now there is an evident obscurity about these descriptions, a contradiction in fact, which must have involved many in perplexity with regard to the real meaning of the authors. Papulæ precisely defined, broad, soft, smooth, and large, and yet not distinguishable in colour from the adjacent skin, easily overlooked, and suggesting to the practised eye some uncertainty as to whether they were *in* or *upon* the skin. I will endeavour to explain the mystery.

388. Prurigo, I believe to be, in its origin, a disease of the nervous system, and specially of the cutaneous nerves. As a consequence of the altered innervation of the skin, the dermal tissues become changed in structure—namely, condensed and thickened. The most careless examination is sufficient to establish these two points; the skin feels hard, it moves like a piece of thick leather; the areæ included between the lines of motion are large; its natural suppleness is gone; its very colour is changed; it looks yellowish and dirty. But it is smooth; there are no such projections as we should call pimples, or if there be, they are few and scattered. Arrived at this point, there remains but one conclusion for the student. There are no papulæ, therefore the disorder cannot be prurigo. And yet the disease is so characteristically prurigo, that, setting aside the symptom of pruritus, the dermatologist is enabled to decide at once upon its name.

What, then, are the signs by which prurigo is so immediately distinguished? They are, the thickening and condensation of the skin, and the consequences of this condition. Upon close examination, the angular areæ included by the linear markings of the skin (§ 31) are seen to be raised above their natural level, the elevation being occasioned by the thickening of the derma. That this is the case is evident from the positions of the pores—namely, in the furrows which constitute the linear marking, and at the point of divergence of several of these. The elevations, therefore, are simply the effect of a swollen state of the derma, the areæ being magnified by hypertrophy, and the linear markings being magnified in depth by the same cause. These swollen areæ are the so called papulæ, the broad and flat and smooth papulæ. It is not, then, to be wondered at, that they should be with difficulty discerned, that they should be "overlooked," seeing, as I have shown, that they are not papulæ at all.

But we do meet with papulæ in prurigo, although not a necessary feature of that disease. These papulæ are not the areæ of the linear markings of the skin; they occupy the grooves of the linear markings. They are, in fact, the pores raised into pimples, and are identical with the pimples of lichen. It is these latter which generally suffer abrasion of their tips from scratching, and then become surmounted by a small dark-coloured scab.

389. The papular group of diseases of the skin offer no transitional

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[1] Bateman, Synopsis, third edition, p. 15.

characters to the pustular affections which preceded them, unless we consider as manifesting that relation the large papulæ with pustular heads, which are frequently found in association with syphilitic lichen. Their alliance with the succeeding group—namely, of squamous diseases—is hardly more direct, consisting only in their elevation above the surface, and in the production of a thin furfuraceous scale, by which they are surmounted at their decline.

STROPHULUS.

Syn. *Tooth-rash. Gown. Gum.*

390. Strophulus (PLATE 11) is a disease of early infancy, consisting in the eruption of small pimples upon part, or upon the whole surface of the body. The pimples are usually red, but sometimes paler than the surrounding skin; they are attended by itching, which is increased by warmth; but they give rise to little constitutional disturbance, and terminate by resolution and epidermal desquamation.

The appearance, distribution, and colour of the pimples of strophulus have given rise to its division into five varieties—namely,

Strophulus intertinctus.
" confertus.
" volaticus.
Strophulus albidus.
" candidus.

STROPHULUS INTERTINCTUS.

391. Strophulus intertinctus (PLATE 11, I.,) the red gum, or red gown of popular language, is an eruption of prominent pimples, of a vivid red colour, upon one or several regions of the body, or generally dispersed over the entire surface, the eruption being intermingled with minute red points and erythematous patches of variable extent. The pimples remain upon the skin for some time, some disappearing while fresh crops break forth, and the disease terminates, at the end of one or two weeks, by desquamation of the epiderma. Occasionally the strophulus appears at successive periods, being alternated by intervals of freedom from the attacks. This eruption was observed by Willan to be developed principally on the cheeks, the backs of the hands, and the fore-arms. It is unaccompanied by symptoms of constitutional disturbance, and as frequently affects the strongest and healthiest as weakly children. Strophulus is sometimes coincident with acidity of stomach and intestinal disorder, both of which may depend, with the eruption itself, upon the irritation of teething. When the eruption has been repelled by exposure to cold or mismanagement, serious effects have been produced on the nervous system and alimentary mucous membrane.

STROPHULUS CONFERTUS.

392. Strophulus confertus, or tooth-rash (PLATE 11, I.,) is a more severe variety than the preceding. The pimples are more numerous, and smaller in size; they are aggregated into considerable patches, and are often confluent. Sometimes they are distributed generally over the surface of the body, but more frequently are confined to a

single spot, or to several regions, as the face, the breast, or the arms. The redness of the eruption is less vivid, but more lasting, than strophulus intertinctus. The disease usually attains its height in twelve or fourteen days, and then subsides, leaving a copious furfuraceous desquamation of the epiderma. Frequently on its decline a fresh eruption succeeds. Strophulus confertus, according to Willan, occurs in most infants at about the fourth or fifth month.

393. Another form of this disease is described by the same author as taking place in infants of seven or eight months. The pimples in this modification are collected into one, two, or three large and irregular clusters, which appear upon some one point, as upon the forearm, and thence extend, upwards and downwards, along the arm. The patches, as well as the intermediate skin, are of a deep red colour, and are succeeded by an extensive epidermal exfoliation; the skin remains, for some time after, dry and harsh, and of a dull red colour.

This form of strophulus sometimes occurs upon the legs, and assumes a very painful and obstinate form. The eruption extends upwards along the thighs to the loins and abdomen, and produces a redness which is nearly continuous. The epiderma becomes dry, and cracks and separates in large flakes, leaving the integument beneath inflamed and rough. These symptoms, with considerable heat, pruritus, and irritation, may be prolonged for several months, or, as Willan remarks, they may continue until the infant completes its first year.

The constitutional symptoms of strophulus confertus, as of the preceding variety, are very slight, but the local pruritus is troublesome, and often severe. The disease is referrible for its cause to the irritation of teething, as is implied in its popular designation of *tooth-rash.*

STROPHULUS VOLATICUS.

394. This variety (PLATE 11, K.) is characterized by the eruption, of papulæ of a vivid red colour, in small circular clusters, which are scattered over the surface of the body. Each cluster contains from three to twelve papulæ, which are hot, and attended with much itching. In a few days the inflammatory condition subsides, the pimples assume a brownish tint, and the eruption terminates by epidermal desquamation. More frequently, however, new patches appear as the older ones decline, and the disease may be prolonged for several weeks. The patches of strophulus volaticus are particularly observed on the cheeks and on the arms.

Strophulus volaticus is accompanied with general uneasiness and fretfulness, quick pulse, white tongue, and disordered bowels.

STROPHULUS ALBIDUS.

395. In strophulus albidus (PLATE 11, L.) the pimples are white, and minute in size, each being surrounded by an areola of slight redness. They appear for the most part on the face, neck, and breast, and continue for a considerable time. They are not unfrequently intermingled with the red papulæ of the preceding varieties.

STROPHULUS CANDIDUS.

396. In this variety (PLATE 11, M.) the papulæ are of larger size, and broader than in any of the preceding forms; they are hard, smooth, and tense, and without accompanying redness. The pimples are scattered irregularly over the body, but are most strongly developed on the arms, the shoulders, and the loins. They subside at the end of a week, and then gradually disappear. This eruption occurs most commonly in the latter periods of dentition, and is sometimes observed during convalescence from inflammatory disorders.

397. *Diagnosis.*—Strophulus is distinguished from other papular affections chiefly by its occurrence at the infantile period of life. The papulæ so closely resembles those of lichen as to appear identical with that disease. They are indeed modified only by the age of the subject in whom they are developed.

398. *Causes.*—Strophulus is generally due to gastric and intestinal irritation, and is frequently associated with the constitutional disturbance induced by dentition. It occasionally arises from local causes, as from deficient, irritating, or coarse clothing, want of cleanliness, excess of or improper food, heat, &c., and is usually developed in children possessing a delicate and irritable skin. The eruption often alternates with attacks of gastro-intestinal irritation.

399. *Prognosis.*—This eruption is unattended with danger, and rarely presents any features of severity.

400. *Treatment.*—When the eruption obviously originates in local irritation, the acting cause should be removed and frequent ablutions adopted. The tepid bath should be used frequently, together with emollient and sedative fomentations. The pruritus, which is so annoying a symptom in this eruption, may be relieved by a lotion of acetate of lead, or sulphate of zinc, by one containing acetic acid alone, lemon-juice, salt and water, or almond emulsion. When the eruption is dry and chapped, or when an ichorous secretion is poured out, the best application will be found to be an ointment containing the liquor plumbi diacetatis, half a drachm to the ounce; or the oxide of zinc ointment, diluted with spiritus camphoræ, a drachm to the ounce; or, again, an ointment containing hydrocyanic acid or creasote, apportioning the strength according to the necessities of the case. If the disease be associated with gastro-intestinal irritation, it is desirable to avoid the possibility of repelling the cutaneous determination by cold applications, and where this has unfortunately been done, recourse must be immediately had to the warm bath, either simple or medicated with a handful of mustard.

When difficult dentition is the exciting cause, relief may be obtained by incising the gums. And if gastro-intestinal irritation be present, antacid and laxative remedies should be administered. Mercury with chalk, and rhubarb, are valuable medicines in this state of the alimentary canal.

LICHEN.

401. Lichen (PLATE 11.) is an eruption of minute conical papulæ occurring in the adult, and distributed upon a single region, or over

the entire surface of the body. The pimples are comparable in size to millet seeds; they are reddish in colour, or scarcely different from the natural hue of the skin, and are attended with much itching and tingling. They are usually developed in clusters, and appear in single or successive eruptions. They are non-contagious, and terminate in resolution and furfuraceous desquamation, sometimes in superficial ulceration.

402. The appearance, situation, form, and severity of the disease, have given rise to its division into nine principal varieties—viz.,

Lichen simplex.
“ lividus.
“ pilaris.
“ annulatus.
“ circumscriptus.
Lichen gyratus.
“ urticatus.
“ tropicus.
“ agrius.

LICHEN SIMPLEX.

403. In the simple form of lichen, (PLATE 11, A.) the pimples are distributed irregularly over the surface affected, forming little patches from point to point, in which the papulæ are more numerously assembled than in neighbouring parts. Simple lichen is usually a chronic disorder, but occasionally presents itself in an acute form. The acute variety is preceded and accompanied by febrile symptoms, but these are very slight, and are referrible to the disordered state of the system, rather than to the cutaneous disease.

In the acute form of lichen, the eruption is ushered in by some degree of smarting and pruritus, which are increased towards night; the papulæ are red and inflamed, and they continue hot and itchy for several days. In the course of three or four days, the redness begins to subside, the pruritus diminishes, and the papulæ decline; vanishing altogether at the end of a week or ten days, and being succeeded by furfuraceous desquamation of the epiderma.

In the chronic form of the disorder, the papulæ are less red and inflamed. Individually, they run the same course of about a week or ten days, but being followed by successive crops, the eruption is prolonged for several months, and even years. By the continuance of irritation, the skin becomes thickened, and throws off a copious furfuraceous desquamation, which is especially abundant in the flexures of joints.

Willan remarked some modification in the appearance of the papulæ, according to the region in which they are developed. Thus on the face, papulæ are large and rounded in form; on the neck, trunk, and limbs, they are smaller, more vivid in colour, and acuminated, and on the hands they are somewhat paler than in other situations.

The ordinary seat of the acute variety of lichen simplex is the face and trunk of the body. The chronic form of the disease appears to attack by preference the backs of the hands, fore-arms, and arms; and on the lower limbs, the hams and ankles.

LICHEN LIVIDUS.

404. Lichen lividus is a form of lichen simplex, occurring in par-

sons of weakly and debilitated constitution, or in those who are ill-fed, badly-clothed, and live in unhealthy and confined situations. This disease is occasionally met with among the squalid inmates of our workhouses at the period of admission; it is unaccompanied by constitutional disturbance. The papulæ in lichen lividus are soft and somewhat flattened; they present a purplish red or livid hue, are of longer continuance than those of simple lichen, and are developed on the arms and legs, but chiefly on the latter. They are not unfrequently intermingled with petechiæ, and small purple patches. The disease terminates by epidermal desquamation, and is frequently prolonged by successive eruptions for several months.

LICHEN PILARIS.

405. Lichen pilaris (PLATE 11, B.) is a modification of lichen simplex, the pimples being developed around the pores by which the hairs issue from the skin. They are red and inflamed, extend deeply into the follicle, give rise to much tingling and itching, and are chronic in their course. The pimples usually decline at the end of a week or ten days, and terminate by furfuraceous desquamation of the epiderma, but the disease is prolonged by successive eruptions to several months or years. This form of lichen occurs under the same circumstances as the simple variety. It is seen in persons of unsound and irritable constitution, and is frequently coincident with disorder of the stomach and bowels. The abuse of spirituous drinks is a frequent cause of the eruption.

LICHEN ANNULATUS.

406. There is a variety of lichen, in which the disease commences as a mere spot, and increases rapidly in size until it forms a distinct ring. There is generally but one such ring on the whole body; and the eruption may therefore be properly designated *lichen annulatus solitarius*. The existence on the same person of more than two or three of these rings, is an exceptional occurrence. It is an eruption more frequently met with in women and children than among men, and the ring after attaining a certain size remains stationary, for two, three, or four weeks, and then disappears. The boundary ring in lichen annulatus presents some variety in point of elevation and degree of papulation. Sometimes the elevation is so trifling as scarcely to be perceptible, at other times it is strongly marked; usually the ring is formed by a line of well-developed papules, sometimes a double row, while often it is an almost uniform ridge. The want of clear definition of the papules, and the appearance of the area of the ring, which is yellowish and mealy, have caused it to be described under the name of erythema (PLATE 7, L.,) but its proper place, as I have assured myself, is the present group.

The ring in lichen annulatus is of a lightish red colour, with here nad there a more vivid tint, from the presence of a papule of a brighter hue than the rest. The area presents a yellowish tint and is covered with a mealy scurf; it is for the most part uniform, but occasionally has a few papules sprinkled on its surface, and sometimes includes a series of two or three concentric papular rings. This latter kind of ring has received the name of erythema iris (PLATE 7, M.;) but it belongs more correctly to the lichenous group.

407. To another variety of the annulate form of lichen, I have given the name of *lichen annulatus serpiginosus;*[1] its special characters are the development of the rings in considerable numbers, generally upon the breast or back; and the rapid spreading of the rings, so that they run together and form one broad and extensive patch, upon and around which the more or less complete or interrupted markings of its component circles may be traced. This eruption is attended with very considerable itching, and is followed by a mealy exfoliation of the epiderma.

The lichen annulatus solitarius is frequently associated with trichonosis furfuracea or common ringworm, and is in fact the ringworm of the hairless skin. But it is also found where no ringworm of the scalp is present.

LICHEN CIRCUMSCRIPTUS.

408. Lichen circumscriptus (PLATE 11, E. F.) differs from lichen simplex only in the mode of aggregation of the pimples. They are collected into one or several patches, of a circular or oval form, and bounded by a well-defined margin, consisting generally of the largest and most inflamed papulæ. The patches in the first instance appear as small aggregated clusters, which progressively increase by their circumference, while they exhibit a tendency to fade in the centre, and form rings of variable size. In the latter case the boundary of the ring maintains a certain breadth, and forms a kind of riband or belt around the included area, in which a greater or less number of pimples continue to be developed. Lichen circumscriptus is occasionally observed in association with vaccinia.

LICHEN GYRATUS.

409. Lichen gyratus, a variety described by Biett, is a modification of lichen circumscriptus, and consists in the aggregation of the papulæ into one or several narrow and tortuous bands of variable length. Cazenave and Schedel observe, "We have lately seen an instance of this disease in the hospital Saint Louis; the papulæ, collected into little groups, formed a kind of riband, which, commencing on the front of the chest, curved downwards along the inner border of the arm, and continued onwards, precisely in the direction of the course of the ulnar nerve, to the little finger." Rayer remarks that he has seen it form "a kind of collar in front of the neck, extending from one ear across to the other."

LICHEN URTICATUS.

410. In lichen urticatus (PLATE 11, D.,) a variety described by Bateman, the papulæ are of larger size than in other forms of the disease. They are inflamed and prominent, and resemble at their first appearance the bite of a gnat or bug. They generally show

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[1] A figure of this eruption will be found among my Portraits of Diseases of the Skin.

themselves suddenly, and disappear, unless irritated by scratching, in the course of a day. More frequently, however, from the burning heat and pungent itching which attend them, they are scratched, and bleed, and a small black crust is formed upon their summits. The disease seems to be peculiar to children, and is remarkable for its obstinacy. The following case is an illustration of this disorder:

A little girl, three years and a half old, delicate, but healthful in her functions, has been subject to an eruption attended with itching since the age of ten months. In January, 1846, she had measles, and since that period the attacks of the cutaneous disorder have been more frequent. The eruption shows itself in the form of large red pimples, generally isolated, but frequently in clusters, particularly on the face, neck, and shoulders. The pimples are excited by warmth, for example, by the warmth of bed, so that she is sometimes awaked in the night by the itching. They are also excited by mental emotion; thus, if she be scolded, the itching begins; and, to use her mother's expression, she can at all times "rub them up wherever she likes." When left to themselves the pimples subside in the course of twenty-four hours, but when scratched, a little blood oozes from their summits, and desiccates into a small black scab. On some of the pimples a little pus forms at the points; and on the soles of her feet they run into a vesicular form. Each pimple, when it does not subside at once, continues for about a fortnight, but as fresh ones are continually appearing, the eruption has now been prolonged without amendment for three months.

Such was the state of the case when I first saw the patient. I prescribed for her citrate of iron with hydriodate of potash, and the following local application :—

℞
Misturæ amygdalarum amar. ℥vij.
Spiritus rorismarini, ℥j.
Hydrargyri bichloridi, gr. v.
Misce, ut fiat lotio.

The lotion relieved the itching, but the eruption continued unchanged, although the child was obviously improved in health. I then had recourse to quinine with nitric acid; but finding no amendment at the end of another fortnight, I prescribed for her one grain of chloride of mercury, with two of nitrate of potash, twice in the day. Nothing, however, seemed to produce an impression on the disease, and I was glad to avail myself of an opportunity of sending her into the country, to try the effect of change of air.

LICHEN TROPICUS.

411. Lichen tropicus, or prickly heat, is the usual form of this eruption, when it occurs in warm climates. Willan gives an excellent description of this disease, in a communication by Dr. Winterbottom. From this account the following passages are selected:—

"The prickly heat appears without any preceding disorder of the constitution. It consists of numerous papulæ, about the size of a small pin's head, and elevated so as to produce a considerable roughness of the skin. The papulæ are of a vivid red colour, and often exhibit an irregular form, two or three of them being in many places united together, but no redness or inflammation extends to the skin in the interstices of the papulæ."

"The eruption is diffused over those parts of the body which are usually covered, as the neck, breast, arms, legs, and inside the thighs. It does not often appear on the face, excepting on the upper part of the forehead contiguous to the hair; neither is it ever found in the palms of the hands, soles of the feet, nor on the hairy scalp. The number of the papulæ is much increased by wearing flannel, or clothes too warm and thick for the climate. When perspiration is very copious, small vesicles containing a limpid humour, are often intermingled with the prickly heat, more especially on the breast, and about the wrists; but they terminate in scales, having no disposition to ulcerate, though violently scratched. A troublesome itching attends the prickly heat, and prevents sleep during the night. There is likewise a frequent sensation of pricking, as if a number of pins were piercing the skin. This often takes place suddenly after drinking a dish of tea, or any warm liquor, so as to cause the person affected to start from his seat. The eruption is in general stationary, and appears equally vivid in the day and in the night. It does not leave one part and arise on another, unless the former be much exposed to cold, and the latter be heated by additional clothing, or by friction. An increase of heat, indeed, in all cases, produces a greater number of papulæ. They sometimes disappear on a sudden, and return again as suddenly, without any obvious cause; but whenever the eruption continues for a length of time, the papulæ throw off minute scales, and are succeeded by a fresh crop, no vestiges being left in the skin. The prickly heat is in general considered as a salutary eruption, whence we are cautioned not to repel it from the skin by cold or other external applications. Such a repulsion cannot, however, be easily effected; it is certainly not produced by bathing, which has been hitherto thought highly prejudicial. A vivid eruption of the prickly heat is a proof that the person affected with it is in a good state of health, although its absence does not always indicate the contrary. The sudden disappearance of it, which frequently happens, is rather an effect than a cause of internal disorder, as of fever, or of any slight complaint of the stomach; in the latter case, a temporary stimulus applied to the stomach, as by spirits, tea, or other warm liquids, has the power of restoring the eruption. Its appearance on the skin of persons in a state of convalescence from fevers, &c., is always a favourable sign, indicating the return of health and of vigour."

"Various means have been employed to alleviate the itching and tingling of the prickly heat; the favourite remedy at Sierra Leone is the juice of lime rubbed on the skin, which, however, has no considerable effect. I have found it of most advantage to use a light cool dress, and to avoid the drinking of warm liquors."

Dr. James Johnson, who was a sufferer from the prickly heat, gives the following animated description of the disorder:—"This unwelcome guest assails us at all, and particularly the most unseasonable hours. Many a time have I been forced to spring from table, and abandon the repast which I had scarcely touched, to writhe about in the open air for a quarter of an hour; and often have I returned to the charge with no better success against my ignoble opponent. The night affords no asylum. For some weeks after arriving in India, I seldom could obtain more than an hour's sleep at one time, before I was compelled to quit my couch with no small precipitation, and if there were any water at hand, to sluice it over me, for the purpose of allaying the inexpressible irritation. But this was productive of temporary relief only, and what was worse, a more violent paroxysm frequently succeeded."

"The sensations arising from prickly heat are perfectly indescribable, being compounded of pricking, itching, tingling, and many other feelings for which I have no appropriate appellation."

"It is usually, but not invariably, accompanied by an eruption of vivid red pimples, not larger in general than a pin's head, which spreads over the breast, arms, thighs, neck, and occasionally along the forehead. This eruption often disappears in a great measure when we are sitting quiet, and the skin is cool, but no sooner do we use any exercise that brings out a perspiration, or swallow any warm or stimulating fluid, such as tea, soup, or wine, than the pimples become elevated, so as to be distinctly seen, and but too sensibly felt."

In reference to the imagined dangers of repelling this eruption, Dr. Johnson continues, "Indeed, I never saw it even repelled by the cold bath; and in my own case, as well as in many others, it seemed rather to aggravate the eruption and disagreeable sensations, especially during the glow which succeeded immersion. It certainly disappears suddenly sometimes on the accession of other diseases, but I never had reason to suppose that its disappearance occasioned them. I have tried lime-juice, hair-powder, and a variety of external applications, with little or no benefit; in short, the only means which I ever saw productive of any good effect in mitigating its violence, till the constitution got assimilated to the climate, were, light clothing, temperance in eating and drinking, avoiding all exercise in the heat of the day, open bowels, and last, not least, a determined resolution to resist with stoical apathy its first attacks. To sit quiet and unmoved under its pressure is undoubtedly no easy task; but if we can only muster up fortitude enough to bear with patience the first few minutes of the assault without being roused into motion, the enemy, like the foiled tiger, will generally sneak, and leave us victorious for the time."

The author very truly observes, that an affection similar to lichen tropicus is sometimes seen during the summer season in this country. I have myself suffered from its annoying attack on one or two occasions, and can add my testimony to that of Dr. Johnson.

LICHEN AGRIUS.

412. Lichen agrius (PLATE 11, G. H.) is the most severe form of lichenous disease; the papulæ are acuminated and prominent, of a

vivid red colour, and numerous; they are aggregated into clusters of irregular form and size, are attended by much heat, smarting, and itching, by a painful sensation of tension, and are surrounded by considerable inflammation.

These symptoms continue to increase for several days, when the less inflamed papulæ diminish in redness, and become covered by a furfuraceous desquamation. The more inflamed papulæ, however, and especially those which are collected into clusters, have their points torn off by scratching, and form small superficial abrasions, which pour forth an ichorous or sero-purulent fluid, and this secretion desiccates into thin yellowish crusts. The skin around the papulæ is at the same time thickened by the continuance of the inflammation, and fissured by deep cracks, from which a copious watery secretion exudes. In milder cases, the disease subsides before reaching this extreme, the redness and painful symptoms diminish, and the eruption dies away by the twelfth or fourteenth day.

In the severe form, as soon as the crust falls off and desquamation occurs, new papulæ are developed, which pursue the same course as their predecessors, and the disease is prolonged to several weeks, or even months; at other times, the eruption appears and disappears several times in succession before a cure is accomplished.

Lichen agrius is generally partial in its eruption, being confined to one or more regions. It is most frequently seen upon the arms, the hands, the shoulders, the loins, the legs, as also upon the chest and face. On the backs of the hands it constitutes the bricklayer's, grocer's, baker's, and washerwoman's itch of Willan and Bateman. The itching and smarting are sometimes intolerable, and are much aggravated towards the evening, or by the warmth of bed,[1] exercise, stimulating food and drinks, &c. Occasionally the papulæ are intermingled with small vesicles or pustules, which speedily burst, and terminate by desquamation.

The constitutional symptoms which precede and accompany lichen agrius are, rigors, flushes of heat, lassitude, pains in the limbs, headache, nausea, pain at the epigastrium, white, furred tongue, and quick pulse. These symptoms make their invasion for several days previously to the appearance of the cutaneous affection, and are, for the most part, relieved by its eruption. When the disease has been suddenly repelled by treatment or other cause, serious visceral disease has sometimes been established.

LICHEN AGRIUS INFANTILIS.

418. Under the name of psoriasis infantilis, Willan has described lichen agrius, as it is frequently seen in the infant, between two months and two years of age. The disease at this early period is more severe than in the adult, and is modified by the greater susceptibility of the skin. The tettery surface is intersected by numerous chaps and fissures, and frequently excoriated to a greater or less extent by the friction of dress, or of contiguous surfaces. From these

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[1] Mr. Plumbe remarks, that the parts smart for an hour or more as if they "had been severely scalded."

excoriations an ichorous secretion is poured out, which dries into hard scabs of considerable size. Other modifications of the infantile variety of lichen agrius are, phlyzacious pustules, a morbid secretion from the mucous membrane of the nares, loss of the eyelashes and eyebrows when the orbital regions are affected, and the occurrence of hardened elevations, of the natural hue of the skin, or somewhat red, interspersed among the patches. When the eruption occurs about the anus, it frequently terminates in suppuration.

414. *Diagnosis.*—The diagnostic characters of lichen are, its solid and prominent pimples, the coloration of these pimples, and their attendant itching, which is of the tingling kind. The diseases with which it might by inattention be confounded, are the pruriginous affections: prurigo, scabies, and eczema. In prurigo, however, the papulæ are paler than those of lichen, and there is a general unhealthiness of appearance, and oftentimes a disorganization of the skin. The little black scabs, which surmount the papulæ of prurigo, when torn by the nails, and the scratches by which the skin is marked, must also be borne in mind. Scabies resembles lichen only in the presence of itching, but this is different in its character; moreover, it may be remarked, that lichen selects by preference those parts of the body in which the derma is thickest, as the back, the face, and the outer sides of the limbs, whilst only the thinnest regions are those affected by scabies. Eczema, it will be recollected, is a vesicular eruption, and totally distinct from the solid papulæ of the disease under consideration. When the points of the papulæ of lichen are torn off, the crusts which succeed are thinner and more scale-like than those of eczema.

Lichen circumscriptus bears some resemblance, in the form of the patch, to erythema circinnatum, erythema marginatum, and herpes circinnatus, but from these the diagnosis is by no means difficult. In erythema circinnatum the surface is smooth, in erythema marginatum, although raised and papulated, there are no scattered papulæ in the neighbourhood of the patch, while in herpes, there are vesicles, or their detrita, and a greater degree of redness.

Lichen urticatus differs from urticaria, in the irregularity of form and size of the papulæ, their greater redness, and chronic character; and from erythema papulatum, by the small and irregular patches of the latter being merely papuloid, by their inferior degree of redness, and by the comparative absence of pruritus.

Lichen agrius is especially characterized by the close aggregation and highly-inflamed state of the pimples, by the severe smarting and tingling, by scaly crusts, the superficial excoriations or ulcerations, the fissures and chaps which so frequently form, and by the thickening and condensation of the integument.

415. *Causes.*—Lichen occurs principally in persons of nervous and irritable temperament, and at all periods of life. It is most frequently observed in the spring and summer season, and especially in the latter. Increased temperature appears to have great influence in producing the disease, as we see evinced in lichen tropicus, or prickly heat; for the same reason, the eruption is frequently met

with on the arms and face of persons employed near the fire, as of cooks and smiths. Local irritation is not unfrequently the cause, in persons of irritable skin, from the use of flannel or woollen raiment, or coarse body linen. Other exciting causes are, depressing moral or physical conditions, irregularities of diet, intemperate habits, &c. Sometimes it appears critically in fevers, and in acute or chronic visceral affections.

Lichen agrius would seem to be most frequent in elderly persons, females, and young persons of sanguine or nervous temperament. It is usually referrible to fatigue, anxiety, or dyspepsia, and is a frequent accompaniment of the gouty diathesis. But the most troublesome cases of lichen agrius with which I have had to contend, have occurred upon the legs of men who had passed the mid-period of life. These cases were all accompanied with œdema, and sometimes with varicose veins.

416. *Prognosis.*—Lichen is not dangerous to life, but is often exceedingly troublesome and intractable. That which originates from the more simple causes in young persons, and pursues an acute course, generally terminates in two or three weeks, but the chronic kinds may last for years. Lichen of the face is especially obstinate and distressing.

417. *Treatment.*—Simple lichen requires a treatment directed upon ordinary antiphlogistic principles; with locally a tepid bath, or lotions containing liquor plumbi diacetatis, distilled vinegar or lemon-juice, to subdue the local irritation.

In more chronic forms of the eruption, a purgative is always indicated, while attention should be bestowed on the secretions of the liver, kidneys, and skin, and the bowels regulated.

Lichen agrius is essentially a disease of the assimilative functions; and its frequent association with the gouty diathesis must be borne in mind. Antacid purgatives with diuretics and diaphoretics; warm purges of rhubarb and aloes combined with diuretics, or, if the indication be obvious, with colchicum; with lemonade for drink,—are the class of means to be employed. Sometimes a specific course of diuretics is attended with successful results. But the practitioner is often put upon his mettle by this disease, and must use considerable ingenuity to foil the adversary. In females, I have found the mistura ferri composita, with decoctum aloes compositum, and liquor potassæ, an admirable remedy. As soon as it appears judicious to stop the purgative plan, alteratives and tonics come into play; and, in very chronic states of the disease, the special cutaneous alteratives, Donovan's, Fowler's, and De Valangin's solutions.

The activity of treatment in lichen agrius must, of course, be regulated by the severity and extent of the eruption. In the country, and sometimes even in large towns, blood must be taken from the arm, and the operation, if necessary, repeated.

Lichen lividus is to be managed by an alterative and tonic plan of treatment, after a preliminary clearance of the alimentary canal.

The *local* treatment of lichen agrius consists in the judicious selection and application of lotions and ointments; in the *first* instance, to calm the surface while the general remedies act upon the blood; and *secondly*, to modify the local disease when it merges into a chronic form. The best lotions for the former purpose are, the saturnine spirit lotion with camphor and vinegar; a lotion containing the sesquicarbonate of ammonia and liquor plumbi; if the itching be severe, a lotion of hydrocyanic acid; or if there be ichorous discharge, a weak spirit lotion containing one or two drachms of the oxide of zinc to the half-pint. The best ointments for the same purpose are:—ceratum cetacei with a drachm of liquor plumbi to the ounce; the oxide of zinc ointment, either alone or in combination with liquor plumbi or spiritus camphoræ; calamine ointment; or oleaginous compounds of almond oil, lime water, and liquor plumbi, oxide of zinc, or trisnitrate of bismuth.

There has been a fashion of late, and fashions in medicine are always false and dangerous, to abuse ointments, "greasy" applications, as they are universally called. They are, nevertheless, most essential in the treatment of cutaneous complaints; and when they irritate or inflame the skin, the fault is not in the pure ointment, but in the rancidity or otherwise decomposed quality of the substance employed. Ointments are valuable, as agents preventing the hyperoxygenization of the blood which occurs in all cutaneous inflammations, and which has of late rendered *lard* so conspicuous as a remedy for exanthemata, small-pox, and erysipelas. Lotions, on the contrary, unless they be kept constantly applied, are followed by desiccation of the skin, and a consequent increase of irritation of the eruption. There is one substance, however, which may be combined with any form of lotion, and is an exception to this law, namely, glycerine. Glycerine maintains a permanent state of moisture of the surface; and where ointments, in peculiar idiosyncracies, or under particular circumstances, cannot be borne, glycerine will be found to be an efficient and useful substitute. It may be applied either in its concentrated form, or in a state of dilution; being, when pure, perfectly unirritant, and a mild and soothing remedy.

When the purpose of local treatment is to modify the morbid action taking place in the skin, the lotions and ointments best suited to the case, are, a lotion of bichloride of mercury in almond emulsion, or in simple solution with the hydrochlorate of ammonia; a lotion containing creasote; or pencilling with the tincture of croton; or compound tincture of iodine. The ointments are, unguentum hydrargyri ammonio-chloridi; the nitrate of mercury ointment, pure or diluted; calomel ointment; the ointment of the deutioduret of mercury, ten grains to the ounce; the ioduret of sulphur ointment, also ten grains to the ounce; or the unguentum hydrargyri; the force of these remedies being augmented, if requisite, by the addition of friction.

I cannot say that I have seen any advantage result from the use of collodion in this complaint.

PRURIGO.

Syn. *Pruritus.*

418. Prurigo (PLATE 11) is a chronic and non-contagious affection

of the skin, characterized by a thickened and discoloured state of that membrane, and by an excessive and burning pruritus. Moreover, this state of the skin is generally accompanied by an eruption of isolated and scattered papulæ, not differing in colour from that of the general surface. The thickening of the skin gives it a coarseness of character, and upon close examination it is found raised into small flat elevations, caused by the swelling of the little angular compartments between the linear markings (§ 31.) It is also more or less streaked with scratches made by the finger nails, and the torn papulæ are each surmounted by a small, thin and black scab. The colour of the skin is yellowish and dirty. The disease is unaccompanied by constitutional symptoms.

The principal varieties of prurigo, as a general affection, are three in number; to which may be added several local forms. The general varieties are,—

Prurigo mitis,
" formicans,
" senilis.

PRURIGO MITIS.

419. In the milder form of prurigo (Plate 11, n. n.) the morbid change in the skin is less decided than in the severer kinds; but the pruritus is vexatious and annoying. It is brought on by mental emotion, the taking of food, or by change of temperature, and is augmented by scratching, by exercise, and the warmth of bed. The skin which at first presented no appearance different from health, becomes by degrees thickened, indurated, and coarse; the pimples, few in number at first, become numerous, many have their points torn off, and are surmounted by a small black crust; there are scratches here and there upon the skin; it becomes yellowish and dirty; and the epiderma is thrown off as a furfuraceous and pulverulent desquamation. Occasionally the extreme irritation produced by this eruption gives rise to the development of ecthymatous pustules.

Prurigo mitis makes its appearance in the spring and summer months, without premonitory symptoms. It is developed upon every part of the surface of the body, but its more usual seat is the posterior surface of the trunk, the shoulders, the outer sides of the limbs, as of the arms and thighs, the chest, and sometimes the face. When the disease terminates mildly, it declines at the end of two or three weeks; at other times the affection is prolonged for several months.

PRURIGO FORMICANS.

420. Prurigo formicans (Plate 11, n. n.) is a severe degree of prurigo mitis, differing from the latter in the longer duration of the disease, and in the greater violence of the pruritus. The itching is incessant, frequently insupportable, and accompanied by a most distressing sensation, compared, by the sufferers, to having their flesh devoured by thousands of ants, or to the piercing the skin with red-hot needles. Rayer observes that patients describing their sufferings speak of *heat of the blood, burning fires, maddening itchiness,*

&c.[1] It is increased by every alternation of temperature, particularly by the warmth of bed; so that patients affected by this disease tear themselves cruelly with their nails throughout the entire night, and are totally unable to sleep until, towards the morning, they sink from exhaustion into forgetfulness, or, after a night of disturbed sleep, are awaked with the first dawn by their unsparing tormentor. The violence of the scratching to which the sufferers so afflicted yield themselves, produces redness of the skin, and by removing the heads of the papulæ, gives rise to the formation of numerous small black scabs; these little scabs, resulting from the oozing of a minute drop of blood from each of the wounded papulæ, with intermingled scratches, are frequently the only indication of the disease. Prurigo formicans is very tedious in duration, extending to several months, and sometimes, with intermissions, to years. At the termination of the disorder, the skin remains dry and thickened, and the epiderma exfoliates by a furfuraceous and mealy desquamation.

Prurigo formicans is frequently associated with some visceral affection, in which case it may be preceded and accompanied by febrile disorder. When suddenly repelled, serious symptoms have been seen to arise, and call for active treatment. The disease occurs both in children and adults, and at all seasons of the year.

PRURIGO SENILIS.

421. The prurigo of aged persons bears a close resemblance to prurigo formicans; but the disorganization of the skin is more complete, and the itching incessant. The disease is very obstinate, and frequently endures for years.

In severe cases, write Cazenave and Schedel, "the skin becomes swollen and inflamed; eruptions of vesicles, pustules, and boils, appear, and sometimes abscesses are formed. Under such circumstances there are frequently symptoms of fever, restlessness, and sleeplessness, and sometimes indications of gastro-intestinal irritation, &c.—Finally, in these serious and excessively rebellious cases, the patient is tormented with dreadful itching." In one very severe case of prurigo senilis, Willan discovered a number of minute pulices upon the skin, and he remarks upon the frequent association of the pediculus vestimentorum with the eruption; of course, he means upon the lower classes of persons.

Local Varieties.

422. The principal local varieties of prurigo are three in number; they are characterized by intense itching, and by the alteration of the dermal tissues above described as constituting the general affection. Willan describes under this head several other forms of distressing itching, which are unaccompanied by papulæ, and are ascriba-

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[1] The Abbe Morellet was afflicted with this distressing disease at the advanced age of eighty years. It obliged him to rise several times in the course of the night to sponge his body with vinegar and water, containing the acetate of lead. Writing to Alibert, he expressed himself as writhing on the "gril de St. Laurent." A soldier, affected with the same disease, compared his sufferings to being pierced all over with halberds. Alibert records several distinguished men among those who have been afflicted with this persecuting malady, as Plato, Charles V., and Charles IX.

ble to an altered sensibility of the cutaneous nerves. I have therefore thought it advisable to arrange the latter affections under the head of *pruritus*, and treat of them separately in a distinct section of the work. The local varieties of prurigo are—

Prurigo podicis,
" scroti,
" pudendalis.

PRURIGO PODICIS.

423. Prurigo podicis consists in an alteration of the skin, similar to that already described, around the anus, and upon the neighbouring regions of the perineum and thighs. The itching is severe and distressing, and increases at night, commencing shortly after the sufferer has retired to bed, and continuing incessantly for several hours. As a consequence of scratching, the papulæ become covered by minute black scabs, which serve as a diagnostic character. This disease is exceedingly obstinate, and, unless relieved by treatment, wil last for several months. After it has continued for some time, the integument becomes very much thickened.

I am not sure whether this form of eruption might not be advantageously considered as a chronic lichen agrius.

PRURIGO SCROTI.

424. Prurigo scroti is frequently an extension of the preceding disease; the papulæ are developed on the scrotum and root of the penis, and give rise to unappeasable itching. The patient, in making attempts to relieve the pruritus, often produces painful excoriations, which increase his misery.

PRURIGO PUDENDALIS.

425. Prurigo pudendalis is a most distressing affection, but, happily, one of unfrequent occurrence. The disease is situated chiefly on the labia majora, and mucous membrane of the vulva, but sometimes extends upwards along the vagina. The pruritus is generally constant, and so violent as to induce an unceasing necessity for friction with hard substances, or scratching. The continuance of the itching produces inflammation and swelling of the parts affected, and induces symptoms approaching to nymphomania.

426. *Diagnosis.*—Prurigo is distinguished from other papular eruptions by the morbid alteration of the skin, and by the burning pruritus. These characters serve to render the diagnosis between prurigo and lichen very simple. The minute scabs which succeed the broken apices of the papulæ of prurigo are very similar to those of lichen simplex and scabies.

Prurigo cannot be confounded with scabies, when it is recollected that the signs of the latter are a ragged and undermined state of the epiderma, the presence of vesicles, and, above all, of the acarus scabiei. The pruritus of the two diseases is also different; in prurigo it is burning and tingling, and occurs in paroxysms, while in scabies it is constant and more supportable; situation forms another ground of *diagnosis.*

427. *Causes.*—Prurigo appears at all seasons of the year, and at all periods of life, being modified by its occurrence at certain ages. Thus, in children and adults, the first two varieties are most frequent, while in old persons and weakly children, prurigo senilis generally appears. It has been remarked that prurigo mitis is chiefly seen during the spring and summer months. The causes of prurigo are, want of cleanliness, insufficient clothing, residence in unhealthy situations, amenorrhœa, dysmenorrhœa, uterine irritation associated with pregnancy, &c. Prurigo formicans is occasionally induced by the presence of visceral disease and mental affections of long continuance, improper and over-stimulating diet, stimulating drinks, deficient and improper food, &c. Prurigo senilis appears to depend upon debility of the system—a state which is popularly expressed by the term impoverished blood.

428. *Prognosis.*—Prurigo is often exceedingly obstinate, and resists every kind of treatment, and in old persons, by the continuance of irritating and unappeasable pruritus, may be destructive of life. In young and adult persons it is not attended with danger.

429. *Treatment.*—The first point, and one of the most important in the treatment of prurigo, is the employment of baths, which should be used daily. The temperature of the baths should not be higher than seventy degrees, and they may consist of simple water with soap, the alkaline, or sulphur bath. When the daily use of the alkaline or sulphur bath is found to irritate the skin, it should be alternated with the simple soap bath. The cold water bath and sea-bathing may also be found useful in restoring the tone of the nervous system and skin, and promoting recovery.

With a view of exciting a new action in the diseased skin, and modifying its morbid condition, I am in the habit of using stimulating applications, such as the tincture of croton, either pure (§ 275) or diluted with an equal part of spirit of rosemary. Previously to the use of the croton, the skin should be prepared by repeated frictions with a damp sponge dipped in fine oatmeal, and then washed; and after the decline of the eruption which the croton excites, the frictions with oatmeal should be continued. After a few applications of the croton in this way, the bichloride of mercury in almond emulsion, in the proportion of five or ten grains to the half pint, will often complete the cure. I have also obtained considerable benefit from the use of the tincture of iodine, painted on the morbid surface. Another local application that I have found of service in allaying the itching in prurigo senilis is glycerin, applied by means of a sponge.

The applications best suited for the temporary relief of pruritus are vinegar, lemon-juice, weak solution of bichloride of mercury, tincture and watery solution of opium, creasote ointment and lotion, ointment of opium with camphor, the diluted nitrate of mercury ointment, ointment of lime, lotion of hydrocyanic acid, muriate of ammonia, sulphuret of potash, chlorate of soda, &c. It is always necessary, as well as desirable, to have a number of anti-pruritic remedies at hand, for it frequently happens that one may be successful while all the rest fail, and it is constantly found that a remedy which may be perfectly effectual for this purpose in one case, may be utterly useless in the next; I therefore subjoin several formulæ recommended by French dermatologists, and quoted by M. Gibert:—

℞
Hydrate of lime, ʒij.
Subcarbonate of soda;
Laudanum, āā ʒss.
Lard, ℥j.
M.

Anti-pruriginous ointment recommended by Alibert:—

℞
Laudanum;
Sublimed sulphur, āā ʒss.
Oxide of zinc, ʒj.
Oil of almonds, ℥j.
Lard, ℥iij.
M.

Ointment employed successfully by Biett for an obstinate prurigo of the hands:—

℞
Cinnabar;
Laudanum, āā ʒij.
Sublimed sulphur, ℥ss.
Lard, ℥v.
M.

Ointment for local prurigo:—

℞
Muriate of ammonia, ʒj.
Powder of white hellebore, ℥ss.
Lard, ℥iij.
M.

The general treatment of prurigo must consist in the avoidance of stimulating food and drinks, and the use of laxative medicines, diuretics, diaphoretics, alkalies combined with bitter infusions, acid tonics, &c. Milk of sulphur in moderate doses night and morning, for two or three weeks, is sometimes found useful, particularly in the prurigo mitis of children. If the patient have a full pulse, and be plethoric, the loss of a quantity of blood proportioned to his strength is requisite, especially in cases of prurigo formicans. Indeed, I have seen bleeding in such cases act like a charm in allaying the unappeasable torture from which the patient was suffering. In prurigo senilis, a generous and nutritious diet is indicated, with occasional laxative and tonic medicines. When the disease resists the influence of milder means, Donovan's solution, or the liquor arsenicalis may be exhibited without hesitation; of the former of these medicines, ten to twenty drops three times a day; of the latter, five; with meals. It is necessary, in directing the use of these solutions, to advise the common precaution of avoiding acids, fruits, and vegetables, and the omission of the drops whenever any pain, giddiness, or uneasy sensations in the head or pinchings in the stomach are experienced. They may be resumed after a rest of a day or two; or as soon as the symptoms have subsided, and if necessary be continued in a diminished dose.

Prurigo podicis and prurigo scroti must be treated on the general principles stated above; in most cases, constitutional treatment is required. The local means for relieving the pruritus are especially needed in prurigo podicis and prurigo scroti, and in the former, abstraction of blood from the verge of the anus, by means of leeches, is frequently useful. Additional local applications are cold poultices or compresses, ice, cold hip-baths, opium suppositories, cold cream, poultices saturated with liquor plumbi, acetate of lead ointment, the dilute nitrate of mercury ointment, the yellow and black wash, chlorate of soda lotion, &c.

In prurigo pudendalis the local remedies recommended above will be found useful, and their use must be aided by general means, and by depletion, by leeches, from the vulva.

CHAPTER VII.

SQUAMOUS INFLAMMATION OF THE DERMA.

430. Under the designation "Squamous inflammation of the derma," I have assembled a group of diseases which are especially characterized by inflammation and hypertrophy of the derma; by the appearance of the disease, for the most part in patches, which are frequently circular in form; and by the production on the diseased skin of laminæ or scales of abnormal epiderma. The diseases forming this group are three in number, namely,

Lepra,
Psoriasis,
Pityriasis.

431. All dermatologists since the time of Willan are agreed as to the close analogy between these diseases, and the only innovation which has been suggested with regard to them is that of combining lepra and psoriasis under a single genus. If any useful purpose were to be gained by this reunion, I would cheerfully record my vote in its favour, for the similarity of lepra and psoriasis in their essential nature is so complete as to render them almost identical. On the other hand, it may be fairly advanced, that the terms are so well understood that no error can arise out of their separate existence, that time has rendered them classic sounds, which could not well be dispensed with, and, moreover, that certain differences of moment are admitted between them, such as extent of surface occupied, duration, and severity.

432. As respects their pathological nature, there can be no doubt of the analogy subsisting, not between lepra and psoriasis only, but between the three diseases; and whatever differences we may establish in their external appearances, the principle of treatment must remain the same for all. The distinctions which I should draw be-

tween them, amounting to nothing more than specific differences, are as follow:—

LEPRA—hypertrophy of the skin greatest; patches circular in form, most elevated above the surface, healing from centre, never attaining a large size; scales thick, regular in structure; most amenable to treatment.

PSORIASIS—hypertrophy of the skin less; patches irregular in form, less elevated, healing irregularly, always attaining a large size, and often involving the greater part of a limb; scales thinner, irregular in structure; less amenable to treatment.

PITYRIASIS—hypertrophy of the skin least; patches irregular in form, only slightly elevated, healing irregularly, generally attaining a considerable size; often occupying an entire region of the body; scales thinnest and smallest; less amenable to treatment.

433. The type of these affections, established by Willan, is the development of a squama or scale, which he defines to be "a lamina of morbid cuticle, hard, thickened, whitish, and opaque. Scales, when they increase into irregular layers, are denominated crusts." Willan was desirous of rendering the language of dermatology so precise, that no misunderstanding could possibly arise with regard to the exact signification of the terms employed, but his followers have not trodden in his footsteps, and even he himself has shown some inconsistency. With the intention of superior precision, he limited the term crust to the layers of morbid epiderma developed in the scaly diseases. But at the present day we use it, somewhat loosely, to signify such collections on the surface of the skin as from their extent and thickness convey the impression of a mass greater than the acceptation usually assigned to the word scab. For instance, the thick, greenish-yellow concretion which forms in impetigo faciei, and covers the face like a mask, and which is truly a scab, we commonly call a crust, and Willan would seem to sanction the employment of the term in such a sense by retaining the ancient appellation of this disorder, crusta lactea.

434. The hypertrophy of the derma in the squamous diseases is very evident; the papillæ are often so much elongated as to be apparent to the naked eye on the removal of the scale; and the latter, on its under surface, is pitted for their reception like the epiderma of a wart. The cells composing the scale are seen, when examined with the microscope, to be imperfectly formed, to exhibit, in fact, an arrest of development referrible to their early stages of growth, when they are composed of granules (§ 22.) In consequence of this imperfection of formation, and probably as the result of a watery effusion accompanying the growth of the cells, the latter lose the cohesion which they possess in normal epiderma, and the crevices and spaces which exist between them become filled with air. It is this peculiarity of structure that gives to the scales of lepra and psoriasis their peculiar white and silvery character. In lepra vulgaris the central part of the scales is usually condensed, and therefore yellowish in colour, while the silvery whiteness is most conspicuous upon the raised border of the patch. On the small elevations of lepra guttata, the entire scale presents the character of the peripheral portion of the

patches of lepra vulgaris; hence the name lepra alphoides, which was assigned to it by Willan. In psoriasis the scales are more condensed, and therefore thinner and more yellow than in lepra. And in pityriasis they are thrown off as they are produced, and are consequently whitish or grayish, and extremely thin.

435. In his order "Squamæ," in addition to the three before-mentioned diseases, Willan admits a fourth—namely, ichthyosis. In this arrangement he is decidedly in error; ichthyosis bears no analogy whatever to the leprous affections. There is no redness of the skin in ichthyosis, no production of scales of morbid epiderma; the disease being, indeed, one affecting the sebiparous system and not the derma. Alibert still continues to consider the squamous affections under their ancient title, "herpes," and ranges them in his group of "dermatoses dartreuses," in association with acne, impetigo, and lupus.

LEPRA.

Syn. *Alphos. Lepidosis. Dartre squammeuse.* Alibert. *Aussatz.* Germ.

436. Lepra (Plate 12) is a non-contagious and chronic inflammation of the derma, consisting in the eruption, on various parts of the body, of raised and circular patches, which are speedily covered by thin, semi-transparent scales of white and morbid epiderma. The patches are prominent around their circumference, and somewhat depressed in the centre; they increase by the extension of their periphery, while the central area gradually returns to the natural state. During the progress of the patches, the scales are often thrown off, and replaced by successive formations. The local disorder is unaccompanied by constitutional symptoms; it is most strongly marked in the neighbourhood of the knee and elbow-joints, where it frequently forms continuous patches of large size (Plate 12, G.,) and endures for a considerable length of time, sometimes recurring at particular periods for several years, and lasting for several months at each recurrence.

437. The varieties of lepra, with the exception of the syphilitic form, are mere modifications of the same disease, dependent on trivial circumstances. Willan distinguishes four varieties, which are as follow:—

Lepra vulgaris,
" alphoides,
Lepra nigricans,
" syphilitica.

LEPRA VULGARIS.

Syn. *Dartre furfuracée arrondie. Herpes furfuraceus circinnatus.* Alibert.

438. Lepra vulgaris (Plate 12, A. B.) commences by small, smooth, and prominent spots of a dull red colour, usually in the neighbourhood of the knee and ankle-joints, in the lower extremities, and of the elbows and wrists in the upper limbs. In the course of a day or two from their first appearance, the spots are covered with thin whitish scales. In three or four days they have increased in size by the extension of their circumference, which is raised and red, while the cen-

tral area loses a portion of its redness and becomes depressed, the whole patch being covered by a laminated scale of moderate thickness. After increasing gradually in this manner to a size varying from that of a fourpenny piece to a half-crown, the eruption usually becomes stationary, excepting about the joints and upon the scalp, where the circles run into each other by their periphery, and form a continuous patch of large size. These large irregular patches are also produced occasionally in other situations. The scales of lepra are remarkable for their grayish white and silvery hue, being sometimes almost metallic in appearance. They are composed of thin lamellæ, which gradually increase in size from the centre to the circumference, so as to project beyond each other in an imbricated manner, a disposition which is marked on the surface of the scale by a series of concentric lines. When rubbed off by the attrition of dress, or thrown off spontaneously, they leave upon the skin a surface which is of a dull red colour and smooth in recent cases, and rough and furrowed when the disease has already existed for some time. After their fall, the thin crusts are speedily reproduced.

Lepra is rarely accompanied by constitutional symptoms, and is attended with very little local inconvenience, the latter not exceeding a slight degree of itching on getting warm in bed, or on exposure of the body to changes of temperature. When the patches are so extensive as almost or completely to surround a joint, they are productive of some degree of stiffness. The disease is slow in its march, and usually continues for years, sometimes for life, rarely getting well when left to itself.

The first patches of lepra appear about the knee or elbow joint, and often symmetrically on the two limbs at the same time. Willan indicates a point immediately below the patella as the most frequent site of commencement of the disease. Extending from the knee, the patches appear in various points upon the leg as far as the ankle. Willan has remarked, as a peculiarity of lepra, that it invariably occurs in the situation of a superficial bone, as in the course of the tibia, of the crests of the iliac bones, &c., and rarely on the muscular parts, as upon the calves of the legs. The patches also proceed upwards towards the trunk, invading in their turn the upper parts of the limbs and the trunk of the body. Sometimes the disease attacks the scalp, and occasionally the pubic region.

When lepra affects the scalp it confines itself to the limit of the hair, extending for a short distance only upon the neighbouring skin. In this situation the disease is highly inconvenient, exciting much pruritus, and producing an irritation, which is increased by scratching, and followed by a morbid secretion. Nearly the same inconveniences attend the affection when it invades the pubic region, where, in the female, it is frequently accompanied by a distressing pruritus pudendi. When the ends of the fingers are the seat of lepra, the formation of the nails is disturbed; they are thickened and irregular in appearance, and a yellowish curdy matter is deposited beneath them.

As the patches of lepra decline, the central portion of the area resumes its healthy state, and ceases to produce scales. By degrees the scales upon the circumference of the patch become smaller and thinner, the prominence of the skin subsides, and the ring breaks at one or several points, the remains of the patches returning very slowly to the state of the neighbouring skin, (PLATE 12, D. E. F.)

LEPRA ALPHOIDES.

Syn. *Dartre furfuracée arrondie.* Alibert. *Weisse Aussatz.* Germ.

439. Lepra alphoides (PLATE 12, C.) occurs in the form of small convex and flattened scaly spots, raised above the surface, and varying in dimensions from one-sixth of an inch to half an inch in diameter. In general aspect, the smaller spots resemble a number of drops of water sprinkled upon the skin. They are distributed over all parts of the body, particularly on the dorsal aspect of the limbs and trunk, and upon the scalp and face. The eruption commences by small red papular elevations, upon the summit of each of which a small white scale is developed. The papulæ advance quickly in growth, and the scales become larger and better defined, being reproduced as frequently as they are removed. On the decline of the eruption, the affected skin retains a dark-red, or bluish and yellowish stain for one or two weeks. Some of the larger patches fade gradually from the centre towards the circumference, and assume the annular form presented by lepra vulgaris during its progress towards cure.

The eruption of lepra alphoides is sometimes, though rarely, preceded by symptoms indicating constitutional disorder. These symptoms, when they occur, are relieved by the outbreak of the eruption. In children the invasion of the disease with precursory febrile symptoms is frequent; the eruption extends over the whole body in a few days, and is equally rapid in its course. The local symptoms, as in lepra vulgaris, are merely a trifling degree of pruritus when the skin is heated at night.

LEPRA NIGRICANS.

Syn. *Schwarze Aussatz.* Germ.

440. Lepra nigricans is the form sometimes assumed by lepra, when it occurs in persons of a languid and debilitated constitution. The form and distribution of the patches are the same as in common lepra, but they are not so large, and the central depression which marks the commencement of a curative process does not exist. The patches, instead of being of a dull red or rosy colour, are bluish and livid, and the scales thin, so that the lividity of the surface is seen through them. The scales are easily detached, leaving behind a tender, and, frequently, an excoriated surface, from which a morbid serous fluid, often mixed with blood, is poured out. This secretion hardens by degrees into an irregular and friable crust. Lepra nigricans is particularly inconvenient when it affects the scalp.

Willan observes that "the lepra nigricans affects soldiers, sailors, scullermen, stage-coachmen, butchers, brewers, labourers, and others whose occupations are attended with much fatigue, and expose them to cold and damp, and to a precarious or improper mode of diet. Women habituated to poor living and constant hard labour are also liable to this disease."

LEPRA SYPHILITICA.

441. Lepra syphilitica is referred to the chapter on syphilitic eruptions.

442. *Diagnosis.*—The pathognomonic characters of lepra are, the perfect circular form of the patches, together with their elevated border and depressed centre. Their circularity of form is traceable by means of two or three broken arcs of circles, even when a number of disks have run together and formed one continuous patch of large size. Psoriasis differs from these characters in the want of regularity of the patches, in the absence of a depressed centre, in the less inflamed condition of the skin, and in the occasional presence of deep chaps and fissures.

Lichen circumscriptus, with its circular clusters of pimples fading towards the centre, may sometimes be mistaken for lepra in process of cure, but the identity of lichen is established by the presence of a few marginal papulæ; whereas in lepra, the inflamed surface, denuded of its scales, is perfectly smooth.

443. *Causes.*—Lepra is a constitutional affection, occurring at all periods of life, often hereditary, and generally developed in persons having an habitually dry and harsh skin. In such persons, the circulation is feeble, and the natural functions of the skin torpid. Hence it is frequently developed in old persons, and in them is particularly obstinate. The occasional causes of this eruption are, long continued mental emotions; exposure to cold and moisture; deficiency, or poverty of food; highly-stimulating food, and abuse of spirituous drinks; dry and salted provisions; game; the abuse of acids, &c.

444. *Prognosis.*—Lepra is at all times obstinate; in young persons and children it sometimes gets well spontaneously in the course of a few months, while in the aged it often lasts for life. I have seen two cases illustrative of the counter-irritant influence of this disease; the one was a young man, in whom the eruption succeeded to epileptic fits, and seemed to act as the cure; the other was a gentleman of advanced age, in whom the sudden disappearance of a cluster of leprous disks from around the ankle was immediately followed by a severe and intractable dysentery.

445. *Treatment.*—The first and most important indication in the treatment of lepra is, to speak theoretically, the restoration of the disturbed balance of the vital functions. This object is to be effected by a judicious and well-devised regimen; and that which is best suited to the disease, is one of a cooling and unexciting kind. Such a regimen will often cure the eruption without any aid from specific remedies. In truth, the specific remedies for lepra are greatly assisted in their action by the diet, and practice of ablution, with which their use is accompanied. The functions, moreover, require to be brought into healthful condition by means of laxatives, alteratives, or tonics, as the case may be. And where the strength of the patient will permit, benefit will be derived from the repeated abstraction of blood in small quantities.

The internal remedies recommended for lepra are, a course of purgatives; bichloride of mercury in decoction of sarsaparilla, or dulcamara; hydriodate of potash; tincture of cantharides; liquor arsenicalis; liquor potassæ; tar in capsules, or tar water; creasote; sulphuric acid; decoctions of guaiacum, mezereum, and elm bark; infusion of nettles; milk of sulphur, &c.

Of these remedies, that on which I place the greatest reliance is the liquor arsenicalis, or the liquor hydriodatis hydrargyri et arsenici (§ 446.) The former of these solutions in doses of five drops, and the latter, ten to thirty, three times a day, with meals. The latter is the milder remedy of the two, and rarely produces any disagreeable constitutional effects. Of course it is necessary in using arsenical preparations of every kind to counsel the avoidance of acids, fruits, and vegetables, and to explain to the patient the symptoms which call for the suspension or omission of the remedy.[1] The effect of arsenic on the leprous patches is, in the first instance, to increase their redness, activity, and heat, and subsequently to diminish these symptoms, and render them brownish and dull. When the latter change takes place, the eruptions quickly fade and disappear. The medicine requires to be taken regularly, and to be persisted in for months.

Advantage is obtained from combining the liquor arsenicalis with liquor potassæ; or in taking the latter in larger doses (ʒj to ʒij) between meals, while the former is taken with meals. In some instances I have found de Valangin's solution agree with the stomach better than Fowler's; and in other cases have derived benefit and convenience from exhibiting the arsenic in the form of a pill. My formula is as follows:—

℞
Sodæ arseniatis, gr. ij.[2]
Pulveris guaiaci, ʒss.
Antimonii oxysulphureti, ℈j.
Mucilaginis acaciæ, q. s.
Misce bene, ut fiat pilulæ xxiv.

One of these pills should be taken with meals three times a day.

In several cases of obstinate lepra, wherein no benefit seemed to result from the use of arsenic, I was induced, by theoretical considerations, to try the effect of the dilute nitric acid, in doses of one to two drachms three times a day. I gave it at first with a bitter infusion or tincture, but have since preferred its administration in barley-water, sweetened with sugar, prescribing at the same time a Plummer's pill at bedtime, every night. Hitherto I have had reason to congratulate myself on the use of this medicine, but I am unwilling to speak of it with certainty until I have given it a longer trial.

Dr. Anthony Todd Thomson[3] remarks—"I have found no combination of mercury equal to that with iodine, in the treatment of lepra. The biniodide, in doses of a sixth to a fourth of a grain, seems to exert almost a specific influence upon the morbid state of the skin; and when given at the same time as the iodide of arsenic, and aided by bloodletting, it has rarely failed in rapidly and permanently curing the most inveterate cases of the disease. As the acrimony of the preparation has sometimes greatly disturbed the alimentary canal, I

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[1] See note, page 237.

[2] Solve in aquâ destillatâ, quantum sufficit.

[3] Commentaries on Diseases of the Skin, &c., page 24.

Water	ʒj.
Protoxide of arsenic	gr. 1/8.
Protoxide of mercury	gr. 1/4.
Iodine, converted into hydriodic acid	gr. 4/5.

447. The local remedies are, lotions of sulphuret of potash, alkaline baths, vapour baths and douches, sea-bathing, spirituous solution of bichloride of mercury, yellow wash, zinc ointment, white precipitate ointment, calomel ointment, nitrate of mercury ointment, ointments of acetate and phosphate of mercury, of sulphate and deutoxide of antimony, ioduret of sulphur ointment, from ten to twenty grains to the ounce, creasote, blisters, nitrate of silver, &c. M. Gibert speaks favourably of an ointment of the ioduret of ammonia, in the proportion of a drachm to an ounce; and also of the ointments of Anthrakokali and Fuligokali. In the employment of these applications, care must be taken, in acute cases, to use them only after the reduction of the local excitement, by means of fomentations, emollient baths, &c., and then only of moderate strength. In chronic cases, however, they may be employed from the commencement, and in a more concentrated form, with the view of modifying the diseased structures.

"My own practice," says a distinguished author[1] on cutaneous diseases, "is to begin with the white precipitate ointment, or with that of the protochloride of mercury, unless in those cases where the disease is of very long standing, when I try the ioduret of sulphur in preference."

M. Lemery, of Saint Louis, has lately recalled the attention of practitioners to an old, but valuable application, in leprous affections—namely, *tar*. Finding, however, that this remedy was objectionable on account of its colour and odour, he had recourse to one of the products of tar, *concrete napthaline*, which afforded him the most successful results. The preparation which he employs is an ointment, composed of

Napthaline	two to four parts.
Lard	thirty parts.
M.	

This he applies to the diseased skin, on folds of linen, night and morning. The ointment is highly stimulating, and has a powerful smell, which quickly passes away. By means of the napthaline ointment, M. Lemery succeeded in curing eight patients out of fourteen, in from five weeks to three months.

More recently M. Lemery has retraced his steps in favour of tar, of which he makes an ointment, containing one-fourth or one-third of that substance. This he orders to be rubbed into the eruption three times a day, and a tepid bath once or twice a week. Internally he gives at the same time Fowler's solution, commencing with five drops twice a day, and increasing gradually to twelve. He speaks in assuring terms of the success of this treatment.[2]

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[1] Rayer.

[2] Bulletin de Thérapeutique, vol. xxxvi., 1849.

PSORIASIS.

Syn. *Dry tetter. Dartre furfuracée. Kleinaussatz.* Germ.

448. Psoriasis (PLATE 12, H. I. K.) is a chronic and non-contagious inflammation of the derma, characterized by the development of patches, which are irregular in size and form, and covered by thin, irregular, and whitish scales of altered and desiccated epiderma. The patches are raised above the level of the surrounding skin; they are flat upon the surface, or somewhat more elevated in the centre than at the circumference, and are frequently intersected by deep fissures and chaps, particularly where the disease occupies a surface of large extent. Psoriasis may be general in its eruption, being dispersed over the entire surface of the body, or it may be purely local. The former is sometimes accompanied by slight constitutional disorder, and is liable to recur at certain seasons, as in the spring and autumn, for several successive years.

449. The varieties of psoriasis are founded on the form of the eruption, its intensity, and locality, the latter constituting a local group. In a tabular scheme, the varieties may be thus arranged:

General varieties.

Psoriasis vulgaris,
" guttata,
" gyrata,
" inveterata.

Local varieties.

Psoriasis palpebrarum,
" labialis,
" præputialis,
Psoriasis scrotalis,
" palmaris,
" unguium.

PSORIASIS VULGARIS.

Syn. *Psoriasis diffusa.* Willan. *Psoriasis confluens.* Rayer.

450. In the common variety of psoriasis (PLATE 12, H. I.) the patches are of large size, very irregular in their form, and of variable extent. The surface of the patch is of a dull red colour, rough, and elevated above the surrounding skin, intersected by deep furrows, which correspond with those of the epiderma, and generally fissured by several chaps of considerable depth. The patches are surmounted by numerous thin scales of dried epiderma, which are continually exfoliating, and giving place to new and successive layers. The chaps are dry, and covered by thin epidermal scales; they frequently bleed, but very rarely pour forth any secretion. The patches of psoriasis vulgaris are developed either by a number of small elevations, like those of lepra guttata, which run together and form one continuously affected surface; or by several small patches, which speedily increase in size, and coalesce. In either case the patches are two or three weeks before they attain their complete growth; and it frequently happens that the eruption assumes the character of small patches over the greater part of the body, and of large ones around the joints.

Psoriasis vulgaris presents several degrees of intensity and extent; it may occur as a single patch of small or large size, or there may be several. The disease may appear upon all parts of the body, but some it would seem to select by preference. I have seen the eruption most frequently on the fore-arms, or about the elbow and wrist. Unlike lepra, psoriasis affects chiefly the fleshy parts of the limbs. The duration of psoriasis vulgaris is always tedious; in milder cases, it continues for several weeks or months; while in severer examples, it may be intractable for a much longer period.

Psoriasis vulgaris, when extensive, is usually preceded by symptoms of constitutional disturbance, such as pains in the head, pains in the stomach, loss of appetite, nausea, and general languor and debility. These symptoms subside as the local affection becomes developed, and return at each recurrence of the disease. The local symptoms are, heat, some degree of pruritus, particularly at night, a sense of constriction, and, where chaps and fissures have formed, a little pain and tenderness.

PSORIASIS GUTTATA.

Psoriasis discreta. Rayer.

451. Psoriasis guttata occurs in small spots, which are very little raised above the level of the skin, and are covered by thin scales. They are developed for the most part on the trunk of the body; rarely exceed a quarter of an inch in diameter, are numerous and pretty uniform in size.

PSORIASIS GYRATA.

452. Psoriasis gyrata is another modification of psoriasis vulgaris; in this variety the eruption assumes the form of narrow bands, disposed longitudinally, or in variously curved and tortuous lines. The dull, red, and raised surface of the patches is intersected by numerous furrows, and covered with exceedingly delicate epidermal scales, which exfoliate repeatedly, and are as constantly reproduced. This eruption is attended with very trifling pruritus, and but little inconvenience. The disease occurs for the most part upon the trunk of the body, but sometimes on the arms and legs. Psoriasis gyrata is exceedingly rare; Biett saw only two cases at St. Louis during his connexion with that hospital. Mr. Samuel Wood, of Shrewsbury, informs me that he has seen one.

Willan describes a syphilitic psoriasis as appearing in the gyrated form. The eruption in such cases presents the ordinary characters of syphilitic disease of the skin; it is dark-coloured and smooth, presents but few scales, and assumes, as it subsides, a copper-coloured tint.

PSORIASIS INVETERATA.

Syn. *Dartre squammeuse lichénoïde.* Alibert.

453. Psoriasis inveterata (PLATE 12, I.) is the most severe and obstinate of all the forms of scaly tetter, and may be regarded as an intense degree of psoriasis vulgaris. It extends over a considerable surface, usually occupying the entire of the limbs, but sometimes spreading over the whole body, with the exception of the palms of the

hands, the soles of the feet, and the face. The skin in this variety is thickened, congested, and hot, and there is more or less pruritus, which is increased and troublesome during the night. It is, moreover, dry, harsh, stiff, deeply fissured by cracks and chaps, and covered by epidermal scabs, which are produced and thrown off in abundance. The harshness and thickening of the integument are sometimes so great as to interfere with the action of the muscles and movements of the joints. When the surface is abraded by pressure, by the violent use of the nails, or by any other cause, some bleeding takes place which discolours the scaly surface.

In psoriasis inveterata of the scalp the scales collect in great number; and, when the nails are affected, they become yellow, thick, and irregular; they are subsequently thrown off, and replaced by shapeless crusts.

The duration of psoriasis inveterata is indeterminate; it usually lasts for several years, and in old persons for the rest of life.

The constitutional symptoms accompanying psoriasis inveterata are generally very trifling, consisting merely in some degree of gastro-intestinal irritation. At other times, no trace of constitutional disturbance can be observed.

Local varieties.

PSORIASIS PALPEBRARUM.

454. Psoriasis palpebrarum is a chronic inflammation of the integument of the eyelids, which commences at their outer angles, and extends inwards towards the inner canthus. The surface of the diseased skin is red, shining, and chapped, and covered by thin epidermal scales. The disease is attended with troublesome itching, it produces thickening of the skin, which renders the lids rigid, and interferes with their movements; and when the inflammatory action is propagated to the conjunctiva palpebrarum, there is a constant effusion of tears. When psoriasis palpebrarum has continued for a long period, the conjunctiva oculi is liable to become affected, in which case the disease is exceedingly intractable.

Psoriasis palpebrarum may be purely local in its origin, or it may result from an extension of psoriasis vulgaris already affecting the face.

PSORIASIS LABIALIS.

455. This variety occurs around the lips, often to the extent of an inch, and more frequently upon the lower than the upper lip. It is constituted by thickening, scaliness, redness, and puckering of the integument, the puckered appearance depending on the presence of deep furrows, which converge towards the mouth, and are the seat of painful chaps and fissures. The scales are of small size; they exfoliate constantly, leaving the skin red and tender, but are speedily succeeded by a renewed crop. The disease is by no means common; it occurs and continues through all seasons, and is tedious in its duration, extending to months and often to years. Willan remarks, in reference to psoriasis labialis, that "in a man who had it for thirty years, I observed that the gums and inside of the upper lip were

considerably corroded, and that his arms were covered by a thick incrustation."

PSORIASIS PRÆPUTII.

456. This disease resembles in every respect the foregoing variety; the prepuce is red, thickened, covered by thin scales, and fissured by chaps. The disease is exceedingly painful and obstinate, bleeding whenever an attempt is made to draw back the prepuce, and giving rise eventually to phymosis. Psoriasis præputii often occurs alone; sometimes it is complicated with psoriasis scrotalis, and occasionally is coincident with psoriasis palmaris.

PSORIASIS SCROTALIS ET PUDENDALIS.

457. Psoriasis scrotalis is attended with much heat, pruritus, and thickening of the integument of the scrotum. The heat and pruritus are greatly augmented by change of temperature, and particularly by the warmth of bed. The affected skin becomes harsh and dry; is traversed by chaps and fissures of considerable length, and the disorder is frequently aggravated by extensive excoriations, which secrete an ichorous fluid. Psoriasis scrotalis occurs usually in the spring and autumn; it is exceedingly painful and troublesome, and endures for a lengthened period.

Psoriasis pudendalis is an analogous disease to the preceding, affecting the labia majora of the female, and giving rise to distressing suffering and annoyance.

PSORIASIS PALMARIS.

458. Psoriasis palmaris (PLATE 12, K.) is a variety of the diffused tetter, which is limited to the palmar surface of the hands, the fingers, and the wrists. It makes its appearance by one or several elevated patches of large size, which increase in breadth, and spread over the entire palm, extending upwards upon the wrist, and downwards on the fingers. The patches are of a dull red colour, hot, and painful; they are attended by troublesome itching, and by a distressing sensation of prickling and tingling. Soon after their eruption, the patches become covered with dry epidermal scales, which speedily increase in number and thickness, and cover the entire of the diseased surface. As the disease progresses, the epiderma becomes dry and hard, it cracks in the direction of the natural furrows of the hand, and exhibits, at the bottoms of these furrows, chaps and fissures in the derma of variable depth and extent. The thickening of the skin consequent on the inflammatory action gives rise to much pain and stiffness in extending the hand, and any sudden movement is accompanied by bleeding.

Another variety of psoriasis palmaris has been designated by Rayer, *centrifuga;* it is characterized by the development of a single elevated spot, of small size, near the centre of the palm of the hand, upon which a small thin scale is formed. Around this elevation a series of eccentric red circles are successively produced, each circle being surmounted by a fresh epidermal scale. In this manner the disease spreads more or less rapidly over the palmar surface of the hand.

The integument is red, thickened, and fissured by numerous deep chaps, which bleed frequently, and the entire hand is rendered stiff and painful.

Psoriasis palmaris is very slow in its course, enduring for several months, and sometimes for years, or declining during the summer and autumn season, to re-appear successively in the winter or spring, for a number of years. It occasionally attacks the soles of the feet; but in this situation the severity of the symptoms is mitigated by the protective coverings of the part, and the fissures are consequently much smaller or fail to occur. Psoriasis palmaris is sometimes coincident in females with psoriasis pudendalis, and in males with psoriasis præputialis.

PSORIASIS UNGUIUM.

459. Whenever psoriasis extends to the extremities of the fingers, the nails are considerably altered by the disease. Sometimes, as Willan has observed, the affection of the nails occurs alone, in which case scaly patches are frequently developed on other parts of the body, as upon the wrists and arms. The nails, when diseased, are altered in their colour, becoming yellowish and tawny; they are thick and irregular in structure, and rough and ragged at their extremities, being not unfrequently bent downwards over the ends of the fingers.

460. *Diagnosis.*—Psoriasis presents the closest analogy to lepra—an analogy which approaches to, if it be not in truth, identity, as far as the essential nature of the disease is concerned; but in respect of external character there are certain differences. Indeed, it not unfrequently happens, that in the same person the disease assumes in one part of the body the characters of lepra, and in others, those of psoriasis; or that lepra of long continuance, and improperly treated, degenerates into psoriasis inveterata.

Comparing the two affections, we find that in *lepra* the patches are circular, depressed in the centre, with elevated margins, and covered with moderately thick, and but slightly adherent scales, while in psoriasis the patches are irregular, not depressed in the centre, and covered with thinner and more adherent scales.

Pityriasis is another scaly affection with which psoriasis might be confounded; indeed, I am disposed to agree with Rayer, that Willan has not sufficiently distinguished certain varieties of psoriasis palpebrarum and labialis from pityriasis. The distinction between the two diseases lies chiefly in the depth of affection of the skin; thus in psoriasis the morbid patch is always raised above the level of the surrounding skin, while in pityriasis there is scarcely any elevation, the integument being simply congested. Another difference is remarked in relation to the size and appearance of the scales, for in psoriasis the scales are larger and thicker; the epidermal exfoliation in pityriasis being merely a furfuraceous desquamation. Moreover, the integument in psoriasis is always more or less deeply chapped and fissured, which is rarely the case in pityriasis.

461. *Causes.*—Psoriasis is not unfrequently hereditary in its ori-

gin; it may occur in both sexes and at all ages, but is most common in the adult and in females. It usually makes its appearance in the spring and autumn, and follows upon a variety of exciting causes, such as mental emotions, irregularities in diet, salted food, deficiency of nourishment, exposure to cold, chlorosis, arthritic affections, gastro-intestinal irritation, or some constitutional indisposition, drinking cold fluid when the body is heated, &c. The disease appears for the most part in those who are remarkable for dryness of the skin.

462. *Prognosis.*—Psoriasis is at all times and under all forms a very troublesome, and often an intractable disease, but it is rarely dangerous to life. Psoriasis inveterata is so unmanageable as to deserve to be considered incurable.

463. *Treatment.* The observations previously made with regard to the treatment of the allied affection lepra, are strictly applicable to psoriasis; the treatment required is identical in both. In this disease, baths, particularly the vapour bath, bestow much comfort on the patient.

Several cures of psoriasis have followed the employment of the liquor hydriodatis arsenici et hydrargyri. Dr. Graves[1] records a case of severe psoriasis in the adult, that was cured within three months by the exhibition of half a drachm of this solution, taken three times a day. The patient took in all one hundred and fourteen doses, that is, seven ounces and one drachm, containing seven grains of arsenic, fourteen grains of the protoxide of mercury, and forty-four grains of iodine. He was obliged to suspend the medicine for two or three days on two occasions.

Dr. Elliotson[2] succeeded in curing a case of psoriasis inveterata by bleeding; and wine of colchicum, in half-drachm doses, given three times a day. The patient was a man of full habit of body.

For allaying the irritability of mucous membrane that so frequently accompanies psoriasis, Dr. Thomson recommends the liquor potassæ in conjunction with diluted hydrocyanic acid, and administered in the emulsion of bitter almonds. The commencing dose of the alkali should be thirty drops twice a day, and this should be increased to as large a quantity as the stomach will bear. If the patient be weakly, it may be taken in infusion of cinchona or cascarilla.

When the disease is obstinate, and resists all our measures, the more powerful of the local remedies may be employed with the view of modifying the action of the diseased skin. With this object, in the more rebellious forms, Rayer recommends the use of the tartarized antimony ointment.

In psoriasis palpebrarum, the best remedies are, the diluted nitrate of mercury ointment, or the oxide of zinc ointment, &c. I have found the latter especially serviceable in psoriasis labialis, præputialis, scrotalis, and pudendalis.

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[1] Dublin Journal, September, 1840.

[2] Lancet, vol. viii.

PITYRIASIS.

Syn. *Dartre furfuracée. Herpes furfuraceus.* Alibert.—*Schuppen,* Germ. *Dandruff.*

464. Pityriasis[1] (PLATE 12, L.) is a chronic inflammation of the skin, which is characterized by the production of minute white scales in great abundance, on patches of irregular form, and variable dimensions. The patches are of a dull red colour, but sometimes so light as scarcely to be distinguished from the surrounding skin. They are developed on all parts of the body, frequently in succession, and are attended with heat and considerable pruritus and tingling. The scales are thrown off as soon as formed, and are reproduced with great rapidity; they are for the most part small and micaceous; in certain situations, however, where the integument is thick, they are large and lamellar, and in those parts where the integument is thin, as in the flexures of joints, are pulverulent and mealy. Pityriasis is a disease of long continuance, but is not contagious.

465. The varieties presented by pityriasis are distinguishable into general and local; of the former, Willan enumerated three, and of the latter, one. The general varieties of Willan are, pityriasis rubra, pityriasis versicolor, and pityriasis nigra; the first of these alone, deserves to be considered as a squamous disease; the other two are remarkable for their alteration of colour, rather than for the scales which they produce, and are consequently referrible to the chromatogenous disorders.[2] I shall therefore describe the general affection under the generic designation, Pityriasis. The local variety indicated by Willan is pityriasis capitis; to which Rayer has added, pityriasis palpebrarum, labiorum, palmaris et plantaris, præputialis, pudendalis, and pityriasis oris. In a tabular form, the local varieties are,

Pityriasis capitis,
,, palpebrarum,
,, labiorum,
,, palmaris et plantaris,
,, præputialis,
,, pudendalis,
,, oris.

PITYRIASIS VULGARIS.

Syn. *Pityriasis rubra.* Willan.

466. Pityriasis vulgaris (PLATE 12, K.) occurs indiscriminately upon all parts of the body, but particularly in the flexures of the skin, and on those regions which are exposed to the influence of the air, as the face, the neck, and the hands. It is distinguished by the eruption of red superficial patches, upon which the scales are produced, at first in small number, so as to give rise to some degree of roughness only, but subsequently in large quantities. This affection is very commonly

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[1] Der. πιτυϱον, chaff, from the chaff-like desquamation by which it is attended.

[2] After writing the above, I was much pleased to read in Rayer the following passage, in speaking of pityriasis versicolor and nigra:—"diseases which I have felt called upon to transfer to another order, that merely of the adventitious *pigmentary* discolorations."

met with in children and persons possessing a delicate skin and fair complexion, upon the sides of the chin, around the mouth, and on the forehead. When extensive in its attack, pityriasis is attended by excessive itching and tingling, more particularly at bedtime, and during the night. By successive eruption on different parts of the body, the disease may gradually extend over the entire cutaneous surface, disappearing in some parts, while it breaks forth in others. In this manner it is frequently prolonged for months, and is very obstinate; the subcutaneous areolar tissue is apt to become thickened and infiltrated, and if the surface be abraded by scratching, an ichorous fluid is poured out, which desiccates into thin scabs, and complicates the diagnosis of the disease. After the decline of pityriasis, the skin presents for some time a yellowish stain. When the disease is general, or a large surface of the body is implicated, the eruption is accompanied with languor and slight constitutional disturbance.

PITYRIASIS CAPITIS.

Syn. *Dandruff.*

467. Pityriasis capitis appears upon the head, chiefly in children and old persons, commencing usually upon the temples, and around the forehead, and thence extending to the rest of the scalp. It is a troublesome affection, attended with much itching, and at its first invasion, with some degree of redness, which gradually disappears, and leaves the integument whiter than its natural hue. Occasionally it extends to the eyebrows, the whiskers, and the beard. Pityriasis may continue for months and even for years, particularly in old persons; and in severe cases may be accompanied by an ichorous discharge, which agglutinates the hairs, and produces one form of that appearance denominated by Alibert, "teigne amiantacée."

PITYRIASIS PALPEBRARUM.

468. Pityriasis palpebrarum may exist independently of the appearance of the disease in other parts of the body. It is not noticed by Willan as a separate affection, and is probably included in his description of psoriasis palpebrarum. It is characterized by the dull red and abundant scaliness of the typical pityriasis without thickening, or with but trifling thickening of the lids, without elevation of the surface, and without chaps and cracks. It generally occasions the fall of the eyelashes, and frequently spreads to the conjunctiva, producing chronic thickening of that membrane.

PITYRIASIS LABIORUM.

469. "Pityriasis labiorum," says Rayer, "is a variety that has hitherto been confounded with psoriasis, a disease, however, from which it differs in being evolved on the lips and surrounding skin, not as papular elevations followed by thick squamæ, but under the semblance of minute red stains, to which succeed a general redness, and a continual desquamation of the epithelium of the lips, and occasionally of the cuticle of the neighbouring skin." In this affection, the lips are hot and swollen, and constantly throw off a desquamation

of dry epithelium and epiderma, leaving the skin beneath red and tender. On the mucous membrane of the prolabium, the exfoliation is produced in thin lamellæ, which remain partially adherent for some time, and are then thrown off, while on the skin around the lips the desquamation is furfuraceous and mealy. Pityriasis labiorum is obstinate and intractable: Rayer remarks that he has seen two cases of this disease.

PITYRIASIS PALMARIS ET PLANTARIS.

470. Rayer remarks, that pityriasis palmaris and plantaris have hitherto been confounded with psoriasis in these regions; certainly there is sufficient difference between the two to obviate the risk of such confusion, if the diseases be carefully examined. I have seen two cases of this affection, the one in the soles of the feet, the other in the palms of the hands. The former of these was particularly distressing; there was constant and intolerable heat, with painful tingling and tenderness of the inflamed parts, and the epiderma was constantly thrown off in laminæ of variable size. The heat was sufficiently unpleasant during the day, but at night it deprived the patient of rest; he always lay in bed with his feet uncovered, and he was under the necessity of rising repeatedly to stand upon the cold floor, and bathe his feet in cold water.

PITYRIASIS PRÆPUTIALIS.

471. This affection is very troublesome, and is apt to give rise to phymosis. I have seen one case of phymosis produced by it. The characters of the disorder are similar to those of the general affection.

PITYRIASIS PUDENDALIS.

472. Pityriasis pudendalis, like all pruritic disorders in this region, is excessively annoying. The inflammation generally extends to the mucous membrane of the vulva, and is very intractable.

PITYRIASIS ORIS.

473. This variety, like the preceding, rests upon the authority of Rayer, who says, with regard to it—"I have observed the inside of the mouth affected with chronic inflammation and habitual desquamation of the epithelium, especially about the base of the tongue, without any antecedent or concomitant affection of the pharynx, stomach, or lungs—pityriasis oris. This state continued during five or six years, with but brief intermissions, the principal functions being all the while performed with great regularity. At the time a desquamation of this kind was going on, one patient complained of heat, and often of painful sensations, difficult to define, in the interior of the mouth. In a woman who was similarly situated, almost the whole of the mucous membrane of the mouth was habitually of a grayish-white colour, and when the epithelium was thrown off from the tongue, its surface presented several patches of a bright red colour, which continued until the investing membrane was either formed anew, or again rendered thick and opaque."

474. *Diagnosis.*—The chief diagnostic characters of pityriasis are,

the copious production of epidermal scales, the erythematous redness of the skin, and the troublesome pruritus. These characters serve to distinguish it from the yellow sebaceous crusts seen in newly-born children, and remaining adherent to the skin for several weeks. The same signs also serve to distinguish it from simple desquamation of the epiderma, and from psoriasis.

In psoriasis, it must be recollected that the skin is raised in tubercular elevations, upon the summits of which the scales are produced; the scales also are thicker and larger; there is, besides, frequent chapping of the skin, and less pruritus. The same characters serve to mark the difference between an alteration of the pigment of the skin, attended with moderate desquamation, and a profuse production of epidermal scales, without discoloration.

475. *Causes.*—Pityriasis probably owes its origin to some unknown modification of innervation of the cutaneous textures, and is developed for the most part in persons remarkable for the delicacy and susceptibility of their skin. As a general affection, it is more commonly met with in females than in males, and in the aged than in the adult. The local form so frequently seen on the face is often produced by the evaporation caused by cold winds, by chills produced in the same manner, by the irritation of soap, shaving, &c. Sometimes the disease appears to result from irritation of the gastro-pulmonary mucous membrane.

476. *Prognosis.*—General pityriasis is a very obstinate, but, happily, a rare disease. It frequently resists all treatment, and in one instance Rayer saw it terminate fatally. The local forms are also intractable, but not dangerous, and they are very apt to recur at intervals.

477. *Treatment.*—In general pityriasis, if the patient be strong and robust, blood may be taken from the arm, and followed up by antiphlogistic remedies and regimen. The local disorder is to be treated by emollient baths, fomentations, alkaline baths, and opium to lull the pruritus. Dr. Thomson remarks that he found the following lotion—

℞.
Potassæ liquoris, ʒj.
Hydrocyanici acidi diluti, ʒj.
Misturæ amygdal. amar., ℥vii.
M.

more useful in quelling the pruritus than those containing either the biborate of soda, alum, or the acetate of lead. Sedatives are often required to diminish the gastro-intestinal irritation and diarrhœa which so frequently accompany pityriasis. Tonics and alteratives are frequently indicated, and great benefit is often obtained from a course of alkalies, or of the hydriodate of potassa. The following remark by Rayer is deserving of consideration:—"But it is with general pityriasis, as with almost the whole of the chronic diseases of the skin, that are independent of appreciable causes; a solid and enduring cure is only to be obtained by a general change of the constitution, brought about by dietetic means, long and regularly pursued, effected naturally by the progress of years, and the modifications undergone by the organization, or accidentally induced by some intervening disease, such as measles, scarlatina, &c."

Local pityriasis, when severe, demands the same constitutional treatment as the general form, and if convenient, the local abstraction of blood. The local disease, when it affects the scalp, requires the closest attention to cleanliness, and this, indeed, will frequently be sufficient for its cure. The hair should be removed, and when the inflammatory action is subdued, some weakly stimulating application may be used to the surface, such as an alkaline lotion, a drachm of liquor potassæ to half a pint of emulsion of bitter almonds, camphor spirit, or a weak solution of bichloride of mercury. A solution of bichloride of mercury, in emulsion of bitter almonds, in the proportion of two or three grains to the half pint, is the application best suited for patches on the face; and the zinc ointment for pityriasis palpebrarum, præputialis and pudendalis. The white precipitate ointment is the remedy most likely to be useful in pityriasis palmaris et plantaris.

In a case of unusual irritability of constitution, where the eruption of pityriasis was accompanied by a teasing pruritus, relief was afforded by the application of glycerin.

CHAPTER VIII.

INFLAMMATION OF THE DERMA INDUCED BY PARASITIC ANIMALCULES INHABITING THE EPIDERMA.

478. The only disease belonging to this division is,

SCABIES.

The preceding groups of diseases, whether they originate in a local or a general cause, depend upon some pathological condition of the nerves and vessels of the system, or of the part affected. As a consequence of this pathological condition, we may have inflammation of the derma in the various forms herein before discussed, namely, congestive, effusive, suppurative, or squamous. The present group differs from the rest in obeying a specific cause, which may be present without exciting any general or local disorder of the nervous or vascular system, the seat of the cause being the extra-neurous and extra-vascular epiderma. When, however, the cause has been present for a certain period, varying with its number and with the temperament of the individual, we find such local effects produced as would result from the presence of the most common irritant. In the first instance, there is simple excitation of the peripheral nerves, giving rise to pruritus; next, there may be congestion of the capillary vessels; thirdly, there may be effusion of transparent lymph beneath the epiderma, constituting vesicles; and lastly, there may be suppuration, and the formation of pustules; each of these stages following an ascending grade of irritation; the degree in which the irritation is evinced depending in a greater measure on the temperament of the individual than upon the quantity of the cause.

Guided by the Willanean classification alone, we should be led, seeing the alterations above described, in their first stage, to refer the disease to that group which includes erythema; in its second degree of severity, we might follow the example of all the dermatologists of the present day, and regard it as a vesicular disease, while in the highest and less frequent form of aggravation we should place it, as did Willan, among the pustules. It is clear, from the differences of such distinguished men, that any attempt to deduce its true position in cutaneous nosology from the accidental appearances respective of degree of irritation that it may present, must not only fail, but lead to serious errors in diagnosis. I have seen cases of scabies in which there were no vesicles and no pustules, but, nevertheless, the acarus revelled therein in undisturbed enjoyment. Where would be the reputation of the medical practitioner who took no steps in such cases to protect the families among which it existed against the transmission of so repulsive a disease?

Another and a serious error has arisen out of the present position of scabies in the nosological scheme; I allude to the belief that I have heard expressed and seen recorded, that scabies may originate in a disordered state of the fluids of the system; that an *eruption* of scabies may be consequent upon constitutional causes, or be elicited by a particular mode of diet. As well might we conclude that constitutional disease was capable of engendering other external parasites, and treat our patients with internal remedies, while we neglect the external conditions on which their increase depends.

SCABIES.

Syn. *Psora. Itch. Scabies papuliformis, lymphatica, purulenta, cachectica.* Willan.—*Gale.* Fran.—*Kraetze,* Germ.

479. Scabies[1] is an affection of the skin, characterized by scaliness of the epiderma, by vesicles, and in severe cases by pustules; to which may be added accidental abrasions and scratches produced by the nails. It is accompanied by excessive itching, the itching being augmented by warmth, and by the use of stimulating food and drinks.

The above appearances are due to the presence of a minute animalcule, the acarus scabiei, which burrows within the epiderma, and excites irritation in the papillary surface of the derma. The burrowing of this little creature gives rise to the *scaliness* (scabrities) and undermined state of the epiderma. The vesicles, which are few and scattered, bearing no proportion to the number of the acari, and little relation to their seat, present some differences in form and character, respective of their position. Thus in the thin epiderma of the lateral surfaces of the fingers they are distinctly conical and acuminated; on the wrists and other parts of the body they are frequently more or less rounded, and resemble the vesicles of eczema; while in the latter situations they are also variable in size. The vesicles differ in reference to their contents; in those of a conical form, the contained fluid is transparent and viscous; in the rounded vesicle the fluid is also transparent, but in some it is more or less opaque and puriform. The pustules are present only in severe cases, or in persons with an extremely sensitive skin; they are generally psydracious, and vary in size, from the small pustule of impetigo, to the larger pustule of ecthyma.

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[1] Quasi *scabrities.*

When one of the early vesicles of scabies is examined with attention, a minute spot or streak may be observed upon some one point of its surface. This is the aperture originally made by the insect on its first entrance within the epiderma, and from this spot or streak a whitish line may be traced either in a straight or a curved direction, into the neighbouring epiderma. The whitish line is the *cuniculus*, or burrow of the acarus; it necessarily varies in length, being sometimes as much as five or six lines in extent, and at its termination, under a slight elevation of the epiderma, the little inhabitant lies concealed. The acarus may be easily distinguished by the experienced eye as a small dark point at the end of the cuniculus, and if a thin capsule of epiderma be raised in this situation with the point of a needle, the little creature is brought into view.

The spot or streak which is here described is not met with on all the vesicles, for the same animal may excite a series of these in its course; and a number may be developed in the vicinity of its habitation, while in the primitive vesicle alone—that formed by the entrance of the acarus—it is, that the trace of its entrance can be expected. The aperture, again, does not communicate with the interior of the vesicle; it is the too close neighbourhood of the little *grubber* that acts as the cause of formation of the vesicle; the vesicle is consequently a provision of nature to protect the derma from the nearer approach of the *arator*, and the vesicle is formed with the judgment which usually marks Nature's operations—namely, before a defensive provision would be too late. The acarus scabiei, therefore, is *never* situated within the vesicle or within the pustule, and there is no communication between the vesicle and the cuniculus.

The eruption of scabies usually makes its first appearance between the fingers; from these it extends more or less quickly to the wrists, flexures of the elbow, the axillæ, and the abdomen. In weakly constitutions, it may be limited to the hands for a considerable period without extending further, while in severe cases and sanguine constitutions it may speedily spread over the entire body, with the exception of the face, which is very rarely affected.[1] The excessive itching causes persons suffering from this annoyance to scratch, with violence, the seat of the eruption; but the scratching serves only to extend the pruritus, and the skin is often severely torn and abraded. When the points of the vesicles are broken, they become covered with small, thin, yellowish scales, and when they are made to bleed, they are occasionally followed by little black scales, like those of prurigo. When, in consequence of superadded irritation from susceptibility of the skin, from scratching, from injudicious remedies, or from a plethoric state of the system, the vesicles take on the characters of pustules, the disease assumes the appearance which has been described by Willan under the designation of *pustular itch* (scabies purulenta.)

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[1] The only case on record with which I am acquainted, of scabies affecting the face, is one mentioned by Alibert. The subject was an infant, and was supposed to have received the disease from the mammæ of its nurse.

The seat of the eruption of scabies is occasionally found to be modified by circumstances. For instance, while, in the generality of cases, the disease is observed between the fingers and on the wrists, in those who, from hard labour or the manipulation of hard substances, have the epiderma of the hands and arms much thickened, it would be sought for in vain on those parts. In tailors and needlewomen, the eruption is first developed on the hands; and in infants, Rayer remarks, that the vesicles are first perceived upon the breech.

The activity and extent of scabies are strikingly modified by the state of constitution of the patient, its energy maintaining an exact relation with the vigour of the system. When the person is of sanguine temperament, and robust, the scabies spreads rapidly, and gives rise to insupportable pruritus; when, however, the subject is weakly and infirm, or reduced by the presence of other disease, its progress is slow, the eruption partial, and the pruritus moderate.

Although in cold and temperate climates scabies may be regarded as a mild and unimportant affection as respects the health, producing but little local disease, and no constitutional symptoms, yet in warmer climates, as has been well observed by Dr. Adams[1] in Madeira, it is for the most part accompanied by pyrexia, and the local effects are often very severe. The itch-animalcule is very common in the island of Madeira, where it is called *ouçou* or *ouçam*. The following case, illustrative of these remarks, I quote from Dr. Adams's account of these animalcules:[2]—

"A patient (a European) applied to me on account of a spreading inflammation, attended with large vesications, collections of serum, in some places of pus, with intolerable itching, sometimes intense pain and smart fever. All these symptoms were much exasperated at a certain period of the day. I treated it, like any other inflammatory complaint, with evacuants, and poultices to the part. The latter afforded some relief, but my patient grew extremely impatient from the fever and frequent violent pains, which deprived him of sleep. This induced me to examine the part with more care, and to convince myself that, how great soever the pain might be, the mischief extended only immediately under the cuticle. In the mean time, the female servant, who assisted with the poultices, pronounced the disease ouçöes, and to convince him of the truth of her assertion, extracted two from the edges of the sore, which he saw crawling on his nail. This appearance of the disease, so entirely local, and the part affected with such violence, was so different from any thing I had met with before, that no evidence less than the above would have satisfied me. The pain indeed was less surprising, when we consider the disease was immediately on the rete mucosum. Subsequent experience taught me that these symptoms are by no means uncommon. The disease yielded instantly to the usual topical remedy."

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[1] On Morbid Poisons.

[2] Page 298.

480. *Diagnosis.*—One of the most important features in the history of scabies is the distinction of the disease from other cutaneous affections; and this not only with reference to the mind of the patient, but also with regard to the management to be adopted. The treatment which is applicable to scabies would be highly mischievous in other diseases with which it might be confounded; while on the other hand, the means appropriate for the cure of other diseases would leave the itch in full possession of its mischievous activity. The chief diagnostic features of scabies are, *firstly*, a peculiar scaliness and undermined state of the epiderma, which are not met with in other cutaneous affections; *secondly*, its conical vesicles, with acuminated and transparent points; and *thirdly*, and principally, the presence of the acarus, which may be extracted from its retreat beneath the loosened epiderma, with the point of any sharp instrument. The diseases with which this disease may be confounded are, eczema, prurigo, lichen, impetigo, and ecthyma.

Eczema is a vesicular disease, and therefore bears some resemblance to one of the characters of scabies, but the vesicles are globular, and scarcely raised above the surface; they are always collected in clusters, and give rise to a sensation of pricking, rather than of itching; moreover, eczema is not communicable by contact.

Prurigo is a disease attended with thickening and considerable alteration of the skin, and unaccompanied by vesicles; it occurs on the back and shoulders, and the outer sides of the limbs, where the skin is thickest. The pimples of prurigo are frequently torn by the nails, and surmounted by little black scabs, which are characteristic of prurigo; whereas the scabs which form on the ruptured vesicles of scabies are mere scales, and yellowish in colour, a few only being black, when the scratching is carried to the extent of making the vesicles bleed. The pruritus of the two diseases, again, is different; in prurigo, it is burning and painful, which is not the case in scabies, and moreover, the disease is not communicable. Prurigo is occasionally met with as a complication of scabies, and in this case the diagnosis requires a nice discrimination.

Lichen simplex, again, is a papular disease without vesicles, the pimples being for the most part thickly disseminated. When lichen occurs on the hands, it affects the dorsal surface, and not the interspaces of the fingers; the pruritus accompanying lichen is trifling when compared with that of scabies, and the disease is not contagious. Lichen sometimes complicates the eruption of scabies.

Scabies can only be mistaken for impetigo and ecthyma when complicated with pustules; however, the limitation of the pustules to the hands or flexures of the joints, and the presence of the scaly epiderma and conical vesicles of itch, will be sufficient to determine the diagnosis.

Another complication of scabies frequently results from the irritation of substances employed in the treatment of the disease; it is, an eruption of eczema simplex. I have seen cases wherein the treatment of scabies has been continued for upwards of six months, and the disease, to all appearance, has resisted the remedies employed for its cure. But in these cases, the scabies was long since eradicated, and the obstinate eruption which continued was an eczema simplex, induced and perpetuated by the irritating applications used for the cure of the supposed itch. These cases immediately recovered when treatment was laid aside.

481. *Causes.*—Scabies affects all ages, both sexes, and all ranks of society, but is most frequently seen among the lower classes, in whom personal cleanliness is neglected, and the opportunity of communication consequently greater. When the disease makes its invasion in respectable families, its source may generally be traced to laundresses, servants, and their connexions.

The disease is always communicated by contact, either immediately, or through the medium of articles of clothing which have been in the possession of the infected individual. But there are many circumstances predisposing to its influence, such as luxuriant health and vigour, sanguine or lymphatic temperament, the spring or summer season of the year, warm climate, youth, confined atmosphere, want of cleanliness, &c. The period at which the vesicles make their appearance after the invasion of the acarus, presents several important and remarkable modifications, having relation to the state of health and age of the subject, and the season of the year. Thus, in strong and healthy children, the vesicles have been observed at the end of two days after contact, the ordinary period for children being four or five days, while in those that are weakly, the period of eruption may be still further postponed. In adults, the ordinary period of incubation is a week or ten days, but in the winter, the eruption may not appear for a fortnight or three weeks. Old persons, again, require a still longer time for the development of the vesicles, particularly in the winter season.

The proximate cause of scabies is the acarus scabiei,[1] which is transferred by the infected to those who are sound by actual contact. In some instances, it may be conveyed to the sound person in the adult state; while in others, ova, or embryos suspended in the fluid of the vesicles, may be the mode of transmission. Certain it is, that the application of one of these animalcules to the skin of a sound person will give rise to the disease.

Some highly interesting and conclusive experiments on the habits of the animalcule were made, on the revival of the acarus scabiei in France, by M. Albin Gras, a pupil at St. Louis, and published by that gentleman in the year 1834.

Exp. 1.—"On the twenty-eighth of August," writes M. Gras, "in the presence of several physicians and students, I placed two living acari on the middle and anterior part of my fore-arm, and covered them with a watch-glass kept in its place by a bandage. On removing the apparatus on the thirtieth, we found two superficial cuniculi (sillons) half a line in length, and at their extremity two little white points, indicating the presence of the acari. Substituting a fold of linen, retained in its place by a piece of adhesive plaster, for the watch-glass, the acari were left undisturbed for six days longer. At the end of this time, the white points were no longer perceptible, and the cuniculi having become obliterated, had disappeared."

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[1] The history of this animalcule will be found recorded in a separate chapter, at the conclusion of the volume.

Exp. 2.—"On the first of September, I placed seven living acari on my fore-arm, and covered them with a fold of linen, and piece of diachylon plaster. Four days after, we found four or five well-marked cuniculi. On the sixth of September, two of the acari being extracted from their cuniculi, were found active; they were then replaced. On the twelfth, another animalcule was removed and examined; it was quite lively. On the fourteenth, there was considerable itching, with the development of a vesicle; the cuniculi were two lines long. On the sixteenth, there were *several new vesicles near to the cuniculi, but not on their line.* On the seventeenth, the vesicles of the previous day had been rubbed off by the linen, but two or three new ones were visible. On the following day I put an end to the experiment, by rubbing some sulphuro-alkaline ointment into the part. During the course of the experiment, I suffered pruritus from time to time."

Exp. 3.—"On the ninth of the month, I imprisoned six acari on my ring finger, by means of the finger of a glove. Next day there were two cuniculi half a line long. The acarus of one of these burrows was apparent for ten days, the other for three weeks, but after this period they both disappeared. During this interval, I cauterized several suspicious vesicles developed on the same finger, and discovered two new cuniculi originating in acari, that had fixed themselves, without having been observed. None of the vesicles appeared on the line of the cuniculi."

Exp. 4.—"I lately placed nine acari in the bend of my left arm, and retained them there by a compress and bandage. Four hours after, I felt considerable pruritus, and next day perceived four cuniculi. Several days after, some vesicles showed themselves on my fore-arm."

Exp. 5.—"Having placed two acari in the flexure of the elbow of two persons, who expressed their willingness to submit to my experiments, on one, three or four vesicles were apparent on the fifth day, and were accompanied by severe itching. On the other, there were two cuniculi, with pruritus, but no vesicles."

Scabies is not limited to man; it is not unfrequently seen in animals, and by them may sometimes be communicated to man. During the spring of 1840, I had the opportunity of seeing and treating a case so communicated, in the person of a veterinary surgeon, who had received the contagion from an ass upon which he was performing a physiological experiment.

482. *Prognosis.*—Scabies is a mild disease, and little affective of the strength of the system. Some few cases have been recorded, in which the eruption has subsided during an acute disease, to re-appear

as soon as that disease had become somewhat mitigated. Instances have also been advanced, with a view to prove that certain serious visceral diseases have occasionally been developed, upon the sudden retrocession of scabies. These statements, however, are not borne out by observation; but there is good reason for the belief that a brisk attack of itch would rather be useful than otherwise, as an effective counter-irritant.

483. *Treatment.*—The treatment of scabies is purely local; in some instances, it is true, where the subjects are strong and plethoric, benefit may be obtained by the exhibition of aperients, or by the abstraction of blood. But, in the majority of cases, no constitutional means are required.

Numerous therapeutic remedies have been employed from time to time for the cure of this disease; and as the main object to be attained is the extermination of the acarus, many have been successful. Several of these medicines act by means of their stimulating powers, and at the same time that they destroy the parasite, excite considerable irritation in the skin. Others, again, effect this object without causing irritation, or they give rise to much less inconvenience. In selecting our measures of treatment, therefore, our attention should be directed to the employment of remedies which will act with certainty, and will produce the least possible degree of excitement in the cutaneous surface. Such a remedy is presented to us in sulphur, which may, indeed, be regarded as a specific in the treatment of scabies. To effect the cure, the sulphur is well rubbed into the skin, and is conveyed by imbibition into the texture of the epiderma. Here it probably combines with hydrogen, and sulphuretted hydrogen gas is evolved, which acts as a deadly poison on the acarus, and destroys its ova. In some instances, the sulphuretted hydrogen gas in solution is employed as a wash or bath, and answers the purpose perfectly, but is longer in effecting a cure than the sulphur, probably on account of the gradual and constant generation of the gas in the tissue of the epiderma in the latter case. The sulphuretted hydrogen lotion gives rise to less irritation than the sulphur ointment, and is therefore a preferable mode of treatment in children, and persons with a delicate skin. Before either of these or any other remedies are employed, however, it is desirable to prepare the skin for their reception by a thorough ablution with a warm solution of subcarbonate of potash, containing about half a pound of alkaline salt to a gallon of water.

To effect the cure of scabies in the shortest possible time, the best preparation of sulphur is the compound sulphur ointment, of which, in the adult, four ounces should be well rubbed into the entire skin before the fire, and particularly into the affected portions, morning and evening, for two days. It is desirable, also, that the patient should wear a flannel shirt, and retain the same during the whole of the treatment. When this covering is not sufficiently large to envelop the entire body, he should also lie between blankets. On the morning of the third day, the patient should take a warm bath, and wash the skin thoroughly with plenty of soap, when the cure will generally be found to be effected. Much, however, depends upon the manner in which the alkaline ablution and the friction of the affected parts shall have been performed. In some cases, it may be desirable, as a matter of precaution, to continue the inunction for a third day, or to use the white precipitate ointment[1] to the affected parts for a week or ten days, in case any ova may have escaped the influence of the sulphur treatment. In children, one-half of the above quantity of ointment will be found sufficient. This method, while it offers the advantage of a rapid cure, is liable to the inconvenience of producing accidental eruptions. I am in the habit of combining with this plan the internal administration of sulphur, in doses of half a drachm; with a scruple of bitartrate of potash, in treacle, three times a day. And this I should recommend to be done, when the cure by inunction of lard or chamomile ointment is preferred.

When time is not a main object in the cure of the disease, recovery may be effected in the course of a week, with less risk of exciting unpleasant irritation, by means of the simple sulphur ointment combined with subcarbonate of potash, in the proportion of an ounce of the alkali to a pound of the ointment; of this, two or three ounces may be rubbed into the affected parts three times in the course of the day. Or again, by the compound sulphur ointment, used in the same quantity, and at the same intervals.

The sulphuretted hydrogen treatment consists in bathing the surface of the body in a solution or bath of sulphuret of potash, containing one or two ounces of the salt to a pint of tepid water; or in sponging the skin with a mixture of two ounces of each of the following solutions in half a pint of tepid water, many times in the course of the day:

℞.
Sulphureti potassæ, ℥ij.
Aquæ, Oj.
M. ft. solutio.

℞.
Acidi muriatici, ℥j.
Aquæ, Oj.
M. ft. solutio.

The former of these methods is well adapted for young children, but the latter frequently creates considerable irritation, and produces accidental erruptions. The duration of treatment is a week or ten days.

Numerous other preparations, sulphureous and not sulphureous, and each possessing, according to their advocates, peculiar advantages, have been recommended by different authors. Among the more deserving of these remedies are the following:—

Saponaceous compounds.

℞.
Potassæ subcarbonatis, ʒij.
Aquæ, ℥j.
Olei olivarum, ℥ss.
Camphoræ gummi, ʒij.
Sulphuris sublimati, ℥v.
M.

℞.
Sulphuris sublimati.
Saponis alb., āā ℔ ss.
M.

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[1] ℞.
Ung. hydrarg. ammonio-chloridi, ℥j.
Moschi, gr. ij.
Olei lavandulæ, ♏ ij.
Olei amygdalarum, ʒj.
M.

The saponaceous compounds possess the advantage of not soiling the habiliments of the patient, but they require a longer use than the sulphur remedies, namely, two or three weeks.

Pyhorel recommends the friction of half a drachm of sulphuret of lime with sweet oil into the palms of the hands, without any application to the surface of the body, the treatment being continued for fifteen or twenty days. Fantonetti advocated the use of chloride of lime; and Delpech, the employment of frictions of sweet oil alone. This last remedy would, doubtless, act most destructively upon the acarus, should the oil reach the animalcule. In my own practice, I have found sweet oil, containing a little camphor, very successful in infants whose skin was too tender to bear sulphur ointment. And, carrying out the idea of the oily matter bearing a considerable share in the curative agency of the sulphur remedies, I have also employed inunction with lard alone, with a satisfactory result. The lard requires to be well rubbed into all parts of the body, particularly into those chiefly affected, night and morning; and, by the end of a week, the cure is complete. A warm soap-bath should then be taken to purify the skin. Mr. Stiff, in a communication made to the "Medical Times," in 1845, is an advocate for this plan; and M. Bazin, in some trials lately made at St. Louis, states the number of frictions with oil or lard requisite for the cure of scabies, to be six.

M. Bazin, however, prefers an ointment of camomile to the simple lard, and he states, as its advantages, that it cures in three frictions; that it relieves the itching instantly; and that it gives rise to no secondary eruptions, as is the case with the sulphur and sulpho-alkaline treatment. His formula for making the ointment is to mingle equal parts of fresh camomile flowers, olive oil, and lard, and heat them together on a sand-bath. It appears to me that the same purpose would be gained by adding the essential oil of camomile to lard.

Among the simples recommended from time to time by different physicians, or employed popularly, are, solution of tobacco, used by Boerhaave, but liable to many objections; stavesacre; hellebore; scabious; sweet-scented rush; elicampane; and onions.

The use of stavesacre and hellebore has lately been revived, and, according to their respective suggestors, with flattering success. M. Bourguignon recommends that the patients should begin their treatment as usual, by taking a soap-bath; that, after the bath, the stavesacre ointment should be well rubbed into the whole body, particularly into the parts chiefly affected; and that the inunction should be repeated four times a day. On the fourth day the cure is complete, and another soap-bath should be taken. M. Bourguignon's formula for the ointment is, twelve ounces of powder of the seeds of stavesacre, to be stirred into twenty ounces of boiling lard, and macerated in a sand-bath for twenty-four hours. It may then be strained, and some essences added to give it a pleasant odour.

The formula proposed for the hellebore is, to mix together eight ounces of powder of white hellebore with four ounces of soft soap, and sufficient hot water to bring it to a consistence fitted for friction on the skin. It should be used once a day until all itching ceases, and then washed away in a warm bath. After a few frictions, it produces a feeling of heat in the skin.

Especial care should be taken that the whole of the garments worn by the patient, and the bedclothes in which he has lain, should be disinfected by exposure to sulphureous acid gas. This is a measure of great importance in the observance, since the acari and their ova remain attached to all articles of apparel, and are easily communicated by them. Indeed, whenever practicable, it would be desirable that the infected clothing should be destroyed. To complete the eradication of the animalcules, perfumes should be worn in the dress for several weeks.

The treatment of scabies has been enriched by the observations of M. Albin Gras, in the work before alluded to. He observes:—

"I was enabled to obtain living acari from a patient who had taken two or three sulphur baths, containing four ounces of sulphuret of potass to the bath. On the contrary, I have frequently found them all dead after a single friction with the sulphuro-alkaline ointment." "But, although the insects are dead, vesicles still continue to appear for several days."

"Immersed in pure water, the acarus was yet alive after three hours; in saline water, it moved feebly at the end of three hours; in Goulard solution, it lived after an hour; in olive oil, almond oil and castor oil, it survived more than two hours. In croton oil it was living after the lapse of an hour, but dead at the end of four; in lime water it was dead in three quarters of an hour; in vinegar, in twenty minutes; in alcohol, also in twenty minutes; but in naphthaline still more quickly; in a solution of sulphuret of potass, it was dead in twelve minutes; in spirit of turpentine, in nine minutes; in a concentrated solution of hydriodate of potass, the acarus ceased to exist in from four to six minutes; in a solution of arsenious acid it was dead in four minutes; in sulphuric acid, diluted with three parts water, it died in three minutes; in pure creasote, and in concentrated acids and alkalies, its death was immediate. Placed over night on powdered sulphur, the animalcule was found dead the next day; and it required to be exposed to the vapour of burning sulphur for sixteen minutes before it died."

CHAPTER IX.

TUBERCULOUS AFFECTIONS OF THE DERMA.

484. In the physiological classification which I have adopted as the groundwork of this treatise, I originally omitted the order "Tubercula" of Willan. My reasons for this omission were, in the first place, the incongruity of the diseases which he assembles together

under that designation; and secondly, the insufficiency of so artificial a character to convey any idea of the only two diseases which may correctly be retained as affections of the skin. The diseases to which I refer are *lupus* and *kelis*. Rayer recognises the order, but omits several of the diseases proposed by Willan, and the enumeration of those which remain will, better than any commentary, show the propriety of their rejection by me. The diseases comprised in Rayer's order are, lupus, cutaneous scrofula, cancer, Greek elephantiasis, syphilitic tubercles, and accidental or excited tubercles.

LUPUS.

485. The varieties of lupus are two in number—namely,

Lupus non exedens.
Lupus exedens.

Biett classes lupus, agreeably to its effects, into three kinds, namely, into that which destroys the surface; that which penetrates deeply; and that which is attended with hypertrophy. To these Cazenave adds a fourth, which he says has been described by Biett, under the name of erythema centrifugum, but which he prefers to name *lupus erythematosus*. This latter attacks the face, particularly in women; commences by a small spot, which spreads slowly, and is bounded by a more or less raised edge. Cazenave is right in distinguishing this form of cutaneous disease, but whether he is equally so in placing it in the same group with lupus is a question yet to be determined.

LUPUS NON EXEDENS.

Syn. *Herpes exedens. Vitiligo. Leuce.*

486. Lupus non exedens (PLATE 13,) makes its appearance in the form of one or more elevations of a circular or oval shape, slightly raised above the surface, and about two lines in diameter. The tubercles are of a dull red hue, or salmon-coloured, and semi-transparent; and not unfrequently they resemble a reddish transparent jelly effused upon the skin, and streaked with the ramifications of a few small blood-vessels. When pressed under the finger they are found to be soft, and when the finger is removed, they are blanched and flattened. The epiderma covering the tubercles is, at the beginning of the disease, smooth, but later, cracks and peels off, and its white and broken margins are apparent around the circumference of the elevations. When more than one tubercle exists, they are usually found clustered together, and generally assume an annular disposition. The more common seat of this disease is the face, and more particularly the nose. I have also seen it on the lower eyelid, beneath the chin, and on the arm.

The tubercles of lupus give rise to little or no inconvenience beyond their appearance, and may exist for months without undergoing any change. Occasionally they are scratched, and then a thin scale forms upon their summit. Then this scale is torn off, and another is produced; each successive scale being larger than the preceding, and being the cause of a repetition of the violence of scratching. After a variable period of time, more tubercles begin to be apparent around the borders of the original patch. Perhaps this second crop assumes an annular form, and the primary tubercles have subsided and disappeared. The process by which subsidence and disappearance of the tubercles is effected, seems to be one of absorption. There is no ulceration, and yet the tubercles leave cicatrized pits behind them. Sometimes the disease spreads superficially and more quickly over the skin, and then the surface which it has left is crossed by white scar-like ridges and bands. Every trace of the normal structure of the skin has disappeared; it has slightly sunk below the level of the surrounding integument, and the spaces between the white lines are pale, and salmon-coloured, and semi-transparent, the epiderma being smooth, thin, and glossy. Occasionally fresh tubercles spring up on this surface, and the disease is in this manner perpetuated. Sometimes I have seen the patches covered by thick crusts from an oozing of an ichorous fluid following the abrasion of the skin.

When the disease has subsided, the skin never resumes its original appearance, even where there are no cicatrices. The epiderma is very thin, the linear marking of the skin is lost, and it looks flabby and loose. Moreover, the natural sensibility of the skin is also destroyed, a change which may be perceived from the first appearance of the disease.

When the tubercles attack the border of the ala of the nose, their absorption causes a loss of substance of that organ, and gives to the external aperture a notched and irregular outline. When this change occurs towards the anterior extremity, the point of the nose becomes unnaturally acute.

There are fragments of Bateman's description of vitiligo which are peculiarly applicable to lupus non exedens; and I am disposed to believe that it was this disease which he had in view in writing his description. For example, referring to the tubercles, he remarks:—"As they gradually subside to the level of the surface, they creep along in one direction, as, for example, across the face, or along the limbs, chequering the whole superficies with a veal-skin appearance." The veal-skin appearance relates to the inside of the skin, an explanation without which the text is hardly intelligible. To the above comparison Bateman adds, "this white and glistening appearance, bearing some resemblance to the flesh of calves (vituli,) seems to have given rise to the generic term." Again, he observes, in reference to the state of the skin, "a smooth shining surface, as if polished, being left, and a morbid whiteness remaining through life. The eruption never goes on to ulceration." Now, all this corresponds perfectly with the appearance of the area of a circular patch of lupus non exedens, or with the skin on which its devastations have been committed. The disease termed by Celsus "leuce," I also believe to be the affection now under consideration. Bateman, wishing to show that leuce differed from vitiligo, observes, that "leuce deeply affects the skin and subjacent structure, occasioning a loss of sensibility, and ultimately of vitality, in those parts."

LUPUS EXEDENS.

Syn. *Noli me tangere. Dartre rongeante. Esthiomene.* Alibert.

487. Lupus exedens commences, like the preceding, by a tubercle of a dull red colour, but harder and denser in structure than those above described. The more frequent seat of the tubercle is the nose, either the ala or tip, and sometimes the border of the ala or columna. After a variable period of time, during which the tubercle remains indolent, a thin brown and adherent scab forms upon its summit. This scab is usually scratched off, and another is produced in its place by the desiccation of an ichorous fluid which escapes from the abraded tubercle. On the removal of this latter scab, the skin beneath is found more or less deeply ulcerated, and the ulcer soon becomes concealed by another and a larger scab, resulting from the drying up of the sero-purulent secretion which is poured out on its surface.

The ulcer, like the original tubercle, offers much difference in respect of rapidity of progress, being one while very slow, and another while very speedy, in its devastating course. When the latter tendency exists, the entire nose has been seen to be destroyed in less than a month; a character which has been distinguished by the name of *lupus vorax*. The surface of the ulcer of lupus exedens is uneven, sometimes studded with unhealthy granulations, but more frequently covered with white patches of lymph. Its edges are thickened and red, and it frequently pours forth a considerable quantity of a fetid, ichorous, and semipurulent fluid.

When the ulcer of lupus exedens heals, the cicatrix is remarkable for the white and corrugated bands, and the unhealthy-looking skin described in connexion with the previous disease; and the recurrence of the morbid action on these cicatrized spots is far from being uncommon.

Lupus exedens sometimes attacks the interior of the nose, and then a fetid discharge usually precedes the extension of the disease outwardly. It occasions much swelling of that organ. The disease makes its appearance also at the angle of the mouth, or upon the upper lip, and sometimes on the cheek; and in these situations causes considerable tumefaction, with redness of the surrounding skin.

Lupus exedens is occasionally seen as a superficial phagedænic ulceration of the skin. Such a case I have now under my treatment; it is remarkable for its perfectly circular figure. Now and then it appears in the annular form, leaving a circular island of unaffected skin. When its tendency is to proceed inwards to the deeper tissues, the devastation which it occasions is often frightful; all the structures in its course, including even the bones, are destroyed; the nares are laid open, the superior maxillary bones are necrosed, and the eyeballs, losing their support, sink into the chasm which the removal of the subjacent parts occasions. And all this without producing much pain, for the ulcers of lupus exedens, like their tubercles, are remarkable for deficiency of sensibility.

488. *Diagnosis.*—Lupus is easily distinguished from other affections of the skin. Its dull-red, indolent tubercles, in the first instance, their incrustation or ulceration subsequently, and then the unhealthy-

looking or deeply-pitted cicatrix, are pathognomonic characters. To these may be added, its seat; the nose, lips, eyelids, and neck being its more common situations. Rayer observes, that "the solitary tubercles of lupus exedens of the cheeks have frequently been mistaken during their stationary period for small sanguineous tumours or nævi." I have seen the tubercles of lupus non exedens present precisely this character.

489. *Causes.*—Lupus seems to depend upon a scrofulous taint of constitution; perhaps, syphilitic taint might be the more correct expression. It is more common in women than in men, and in the lower than in the middle and higher classes of society.

490. *Prognosis.*—Uncertain and unsatisfactory; the disease is always tedious, lasting for years or for life, and resisting often the best planned treatment. The indolent form is more favourable than the active kind.

491. *Treatment.*—I have obtained the best results in both forms of lupus from a prolonged course of liquor hydriodatis hydrargyri et arsenici; modifying the local disease by the occasional application of the compound tincture of iodine or the acetum cantharidis made with strong acetic acid. As a constitutional remedy, unless special indications call for a different course, I believe that there is no better medicine than the above solution. I have also obtained good results from the protioduret of mercury, combined with guaiacum and the oxysulphuret of antimony. Other remedies that have been favourably spoken of are, iodide of arsenic, liquor arsenicalis, and iodide of potassium combined with decoction of sarsaparilla.

M. Lemery, of St. Louis' Hospital, finding the ordinary remedies for lupus so little successful, had recourse to cod-liver oil, of which he speaks in the most encouraging terms. He begins with the dose of an ounce three times a day, increasing the quantity for fifteen days, by which time he reaches six ounces a dose. If the disease exhibit no indication of submission, he goes on until he arrives at two pints in the day. Should the stomach revolt, a glass or two of seltzer water is given; and if any symptoms of derangement of the alimentary canal or fever supervene, the oil is suspended, but commenced again at the minimum dose as soon as the symptoms disappear.[1]

M. Devergie, M. Lemery's colleague in St. Louis, states that M. Lemery has over-estimated the benefits of cod-liver oil; but that in the serpiginous form of the disease before ulceration has commenced, he has, undoubtedly, found it of service. He mentions the iodide of iron with favour; and, as an application to the ulcerations, the oil of juniper applied every fourth day. The tubercles he treats with caustic.[2]

Lupus exedens requires the local treatment usually employed for phagedænic sores. For example: the nitric acid and chloride of zinc are well suited to destroy the ulcerated surface and excite the capillaries to a more healthful action; and, with the same object, have been recommended, the Vienna paste; the chloride of zinc paste; the arsenical paste; and Dupuytren's powder, which consists of arsenic diluted with two hundred parts of calomel. The Vienna paste is composed of equal parts of potassa cum calce and quicklime, and is made into a paste with spirits of wine; the chloride of zinc paste is made by adding one part of the chloride to two or three of flour, and moistening the powder with water; and the arsenical paste is made by combining together equal parts of arsenic and animal charcoal. The Vienna paste requires to be applied by means of an aperture in a piece of plaster, and may be left on from ten to twenty minutes. The chloride of zinc paste may be left on from four to eight hours. M. Petrequin gives a preference to the chloride of gold as a caustic, and, next to that, to the acid nitrate of mercury. To promote the healing of the ulcer, a weak solution of nitrate of silver, a lotion of chloride of lime, or a weak creasote lotion will be found useful.

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[1] Revue Medico-Chirurgicale, vol. iv.

[2] Bulletin Thérapeutique, 1848.

For the form of eruption, termed by Cazenave lupus erythematosus, that gentleman recommends sudorifics internally, particularly guaiacum, and, locally, tar ointment; or the iodide of mercury, combined with olive-oil, in the proportion of half a drachm to the ounce, to be pencilled on the eruption daily or every other day.

KELIS.

Syn. *Kelois. Chelois. Cancrois. Keloides. Kelis vera; genuina; ovalis; radiciformis; cylindracea; clavata. Dartre de la graisse. Der knollenkrebs,* Germ.

492. The disease of the skin, termed kelis, was first particularly described by Alibert, who distinguished it by the name of "cancroide;" assigning, as his reason for selecting that term, the judicious practice of early observers of designating diseases by the names of the things which they most nearly resembled. The word "cancroide" is therefore intended to draw the attention to a supposed resemblance in form between this disease and a crab, and is synonymous with "cheloide," derived from χηλη, forceps cancrorum, the term used by Rayer and Gibert, by reason, remarks the latter, of the likeness which the prolongations of the tumour bear to the feet of the crab. Another name given to this affection, and one which I regard as most correct, and have therefore adopted, is kelis, derived from κηλις, macula, vel, probrum; this term having reference to the singularly cicatrix-like appearance which the disease so frequently presents.

Besides the preceding, Alibert had another reason for employing the term "cancroide," namely, that of associating this disease with cancer. The cancroids, he observes, maintain a relation both with tetters and cancers; like the latter, they often give rise to acute, pungent, and lancinating pains; and, he asks, "Will they form an intermediate genus." This is a more important question than that of the etymology of the disease.

It is quite true that in many of their features the keloids have a remarkable resemblance to cancer,—for example, in their hardness, whiteness, the meandering of small veins on their surface, the total disorganization of the skin by which they are accompanied, their extension into the deeper parts of the skin, by root-like prolongations, and, above all, in the acute, burning, smarting, and lancinating pain with which they are frequently attended. On the other hand, it must be admitted, that they rarely, if ever, pass spontaneously into a state of ulceration; they have none of the large and tortuous veins which surround a cancerous tumour, the adjacent skin is wholly unaffected, the lymphatic glands are not implicated, the tumours are extremely slow in their progress, often stationary for years, and sometimes they disappear entirely.

Cazenave and Schedel remark, that the kelis should be "carefully distinguished from cancerous affections with which, in truth, it has very little analogy." Rayer says, that "keloid formations do not seem to have any deleterious influence on the general health." Dr. Warren calls it a "troublesome and dangerous disease." Troublesome it is certainly, but I do not consider it dangerous, and I am of opinion that the case upon which Dr. Warren founds his inference of the danger of kelis was not an instance of this disease, but one of cancer. He states that it affected the ala of the nose; that, after several extirpations, "a considerable tumour appeared on the face, and another under the jaw," while, a fortnight after, "a tumour is seen extending from the right eye and side of the nose to the cheek, where there is a frightful enlargement, including all the textures of the face and gums."

According to the admission of all writers on the subject, the disease is rare; so much so, that the total number of cases which I have succeeded in finding recorded, amounts only to twenty-four; whereof, twelve are reported by Alibert, five by Rayer, three by Biett, two by Gibert, one by Dr. Warren,[1] and one by Dr. Peace. To this number I may add seven that have occurred in my own practice.

Of the twelve cases reported by Alibert, eight occurred in women. From this circumstance he was led to deduce the inference that the disease was more common in females than in males. Five out of my seven cases, on the contrary, were males; while four out of the five mentioned by Rayer were also males. Of the entire twenty-seven, the sex is unmentioned in three; and of the remainder, fourteen were females, and ten males.

493. The *cause* of kelis must evidently be sought for among those conditions of the constitution, whatever they may be, which give rise to lupus and cancer. In five of my seven cases there existed no known cause, and the same may be said of the majority of the examples reported by other authors. In four only of the twenty-seven cases is any thing like a remote cause established, and that of so trivial a nature, as to be obviously inadequate to the production of so grave a disease. In one of Rayer's cases the tumour sprang from the cicatrix of a burn received in childhood; in another, it arose from the cicatrices of small-pox; and in a third, from the cicatrix of a small punctured wound; while, in one of Alibert's cases, the remote cause was a slight scratch. Of the two instances in which I was enabled to trace the growth to a cause, I found one to result from the application of irritating substances to the skin; and the other to originate on the seat of application of a blister. From this circumstance

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[1] The second case reported by Dr. Warren appears to me to be an instance of carcinomatous disease rather than of kelis.

I felt inclined to classify these two cases with others, which are seen more frequently, and which are termed "false kelis." These latter may always be traced to some local alteration of the skin, such as a cicatrix.

With the exception of one of Alibert's cases, I find no reference made to any hereditary disposition to carcinomatous disease: in the instance in question, a sister of the patient died of cancer uteri. The mother of one of my patients died, he informs me, of a similar disease, but I can trace nothing of the kind in the families of the other patients.

The similarity of position of the morbid growth in the greater number of the recorded examples of this disease is very remarkable. In three of my cases the tumour occupied the centre of the sternum; while, of twenty-two cases (of the before-mentioned twenty-four) in which the seat of the disease is stated, thirteen were situated on the same spot.

A matter of the first importance in a practical point of view, is the degree of annoyance which these tumours are calculated to give to our patients. Alibert observes, that they are the torment of existence, that they are usually attended with increased heat, that they are often accompanied with itching and pricking to an extent that is insupportable, that the pain is acute, pungent, and lancinating, and like the piercing of the skin with burning needles. That, often, the pain extends to surrounding parts, and, occasionally, there is as it were a dragging from within. On the other hand, they are sometimes indolent, and merely give rise to stiffness of the skin. The cases seen by Rayer appear to have been of the milder kind referred to by Alibert; he remarks, that at their commencement they are mere points, and these points are affected with "pruritus of a pretty severe description." When they increase to the size of a "small hazel-nut or the barrel of a quill," they are generally indolent, "unaffected with morbid heat or pain," and very seldom, indeed, the seat of "any thing like painful shooting sensations." Further, he says, that the inconvenience they occasion is, in general, so trifling, that he has known patients "refuse to submit to the curative means proposed for their relief." Cazenave and Schedel state, that the little tumours arise and grow without pain: in other respects, these authors follow the description of symptoms given by Alibert. Dr. Warren mentions a case which was accompanied by a "stinging, burning pain." In Dr. Peace's case, the tumour originated without pain, but, after eighteen months' growth, was so painful as to prevent the patient from lying on the affected side.

494. In a good example of kelis, illustrated in my "Portraits," the patient was a robust man, forty-eight years of age. The disease first attracted his attention about seven years before his application to me. He then perceived upon the middle of the breast four slightly-raised tubercles, which coalesced and gradually increased in size, until they formed a broad-spreading, irregularly shaped excrescence. In figure, this excrescence bore some resemblance to a bird, the head of the bird pointing towards the right breast, the wings spreading out above and

below, and the body and broad tail crossing the sternum to the left breast. The length of the kelis from the head-like process to the opposite extremity was three inches and three quarters, while, across the wings at its broadest part, it measured three inches. Its elevation from the surface of the skin varied between two and three lines, the most elevated part being at its border.

On a first inspection the morbid excrescence had the appearance of the cicatrix of a burn, and, upon closer examination, the only character at variance with that idea was its elevation from the surrounding skin, particularly at its borders. Its colour was pink, lighter in the centre than at the circumference, and it was marked on the surface by a coarse network of prominent white lines or ridges. The general direction of these white lines corresponded with that of the long diameter of the kelis, but upon the four processes of the excrescence they had a transverse or semi-circular direction. From these processes a number of red and white lines were given off which resembled roots shooting into the substance of the unaffected skin.

It was also evident, from an examination of the keloid, that its growth proceeded by an extension of the margins of the four processes only, while the intermediate portions of its border—namely, those forming the angles between the processes, were drawn onwards over the sound skin without participating in the deeper growth. The borders in these situations were rounded and free, and about two lines in thickness, and a probe might be passed beneath them to a distance of half an inch, and, in one or two places, to a greater depth. Indeed, these hollow ways were a source of some inconvenience to the patient, by serving to collect dirt and flue from his dress, and he was obliged from time to time to have recourse to means for clearing them out.

Besides the pink hue of the excrescence, its cicatrix-like lines and ridges, the depressions between the latter, and its elevated borders, the surface of the kelis presented a smooth polish, like that of the new skin of the cicatrix of a burn, and a sort of semi-transparency. There were also visible, here and there, particularly about its circumference, several small meandering blood-vessels, apparently veins, collecting the returning blood from minute tributaries.

To the touch, the kelis gave the idea of a hard, resisting structure like fibro-cartilage, invested by a soft velvety-seeming skin. The central portion was harder and more dense than the circumference, and the white lines had all the rigidity of bands of fibrous tissue.

The patient's application to me had reference to the propriety of removing the excrescence in consequence of the pain and annoyance to which it had given rise during the last three years, and more particularly as the pain was evidently on the increase. At times he suffered much from excessive itching, at other times the pain was smarting, burning, and shooting, and, occasionally, he experienced a darting sensation which he compared to an electric shock. The pain did not endure long, but it recurred frequently, and was excited by any movement which produced pressure on the growth, such as, bringing his shoulders together, or lying on his side in bed. He was not aware of any increase of pain depending on the change of season or weather, and the excrescence underwent no alteration of colour or bulk from mental or bodily excitement, exercise, or elevation of temperature.

Besides the kelis on the breast, the patient has a second on the outer side of the left leg, over the head and upper part of the shaft of the fibula. This excrescence is of the cylindrical kind (kelöide cylindracée, Alibert,) and, like the preceding, is accompanied by its satellite, a small round tubercle situated near its lower end on the calf of the leg. The cylindrical kelis measured three inches in length, and was broader at the extremities than in the middle; measuring at its narrowest point one quarter of an inch, at its upper end three-eighths of an inch, and at the lower end five-eighths of an inch. Its elevation was about one line.[1]

The patient is not aware of any *cause* for this disease, either local or general, no scratch, no abrasion or undue friction of the skin, as a starting-point. He was in good health at its first appearance, and has remained so since. None of his family have suffered from any thing similar. His mother died of cancer of the womb, at the age of seventy-one, having been first attacked by that disease within twelve months of her death.

495. A London physician, forty-one years of age, had two of these tumours of the cylindrical kind; one being situated on the right shoulder, over the spine of the scapula, the other on the buttock of the same side.

They first attracted his attention about five or six years ago, when the tumour on the shoulder was not larger than a horse-bean. At present it measures an inch in length, by one-third of an inch in greatest breadth, and has an elevation of about one line. This tumour presents obvious indications of having originally consisted of three hemispherical tubercles, subsequently united by a connecting ridge. The tubercles having been of different dimensions, the kelis is larger at one end than at the other, and the connecting ridge is nodulated near the larger end from the presence of the third and smallest tubercle.

The kelis on the buttock consists in like manner of two tubercles of unequal size joined together by a narrow ridge. The length of this formation is one inch and a half, and its greatest breadth somewhat less than three quarters of an inch.

The colour of the growth is a dull pinkish-red; they are smooth and even on the surface; are covered by a very thin epiderm; and have none of the white lines of the previous case. They are soft superficially, but hard, dense, and resisting like fibrous tissue in their deeper structure, and they are strictly limited to the skin.

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[1] Since the completion of the above details, I have again seen the patient. The kelis on the breast is more painful than it has ever been, and it is slowly on the increase. The pain is confined to the edges of the excrescence, and is greatest where growth is most active, the central part being comparatively insensible. On requiring him to take off his clothes, I observed four tubercles of keloid formation on the left arm; they were situated on the cicatrices of as many boils, which had resulted from an accident he had met with six years before. He had been thrown out of a chaise, and falling on his left side, had sprained his wrist. The arm became swollen and inflamed, and when the inflammation subsided, the boils made their appearance. He had not mentioned these enlargements to me, because he considered them as merely the remains of the boils. They had always maintained the same size, were never painful, but were occasionally affected with pruritus. He informs me that he had never suffered pain from the kelis on the leg, but has sometimes been troubled with pruritus.

Their most characteristic symptom is an occasional stinging, hot pain, compared by the sufferer to piercing the skin with a fine needle made red-hot, and a tingling, itching sensation after being touched or rubbed, or under an increased degree of cutaneous circulation, such as occurs in hot weather. A vehement desire to scratch is awakened by the itching, but, on the whole, they give rise to little pain or annoyance. In the summer they are more troublesome than in the winter season.

During the last two summers, and particularly the last, the kelis on the buttock was excessively tender, so tender, in fact, as to cause pain on the slightest friction, as in that occasioned by the clothes in walking.

496. A gentleman forty-four years of age, of ordinary stature, stout, and of full habit, by profession an actuary in a Metropolitan Assurance Society, had his attention drawn, about eight years since, in consequence of suffering a violent itching of the skin, to a small tumour situated on the middle of the breast. The little tumour was oval-shaped, smooth, of a reddish colour, and about the size of a split horse-bean. From this time, the itching in the tumour and immediately surrounding skin frequently recurred, more especially after any kind of mental or physical excitement, after taking wine, after walking, or upon getting warm. Occasionally there were, superadded to the pruritus, sensations of smarting, stinging, burning, and prickling, particularly on the occurrence of atmospheric changes. In speaking of these sensations he compares them to the sudden piercing of the skin with a number of needles.

The tumour continued to enlarge gradually for the first two years; it then remained stationary, only changing with his state of health, for the next five years; and, during the last twelve or fifteen months, has been slowly diminishing in size. At present it is very slightly convex or nearly flat on the surface, and lies across the middle of the sternum, resembling in its general form a sheaf of wheat, being narrow at the middle, and broad at either end. Its greatest length is one inch and three quarters; its breadth, at the middle, one-third of an inch; and, at the expanded extremities, nearly one inch. It is thickest at the narrow mid-portion, where it has an elevation of one line, and from this point gradually subsides to the level of the surrounding skin.

Its colour is pink, with a whitish line running longitudinally through its middle, and dividing at its expanded portion into four or five indistinct radiating streaks. It is, and always has been, perfectly smooth and polished; and, upon close inspection, a great number of minute venules may be seen meandering from its central part to the circumference. In consequence of the tension of the skin, the prominences of the pores of the follicles are obliterated, and it might easily be mistaken for the projecting cicatrix of a deep burn. When examined by the finger, the skin is found to possess a velvety softness, beneath which may be felt a hard cord running through the middle of the tumour, and dividing, in the expanded portion on each side, into four or five smaller cords; which extend like roots into, and appear to be lost in, the deeper structure of the corium. This hard cord and its terminal branches correspond with the whitish longitudinal line and its radiated streaks above described.

The principal change which the kelis has undergone in the progress of growth is a greater amount of general elevation of the whole tumour, and a special prominence of the central cord and its radii. The patient informs me that, at the height of its growth, it had an elevation of three quarters of an inch at its central part. He also states that it underwent frequent changes of dimensions having reference to his state of health, being one while swollen and another while contracted in size. It has never been wrinkled, nor has there been any cuticular exfoliation from the surface.

In his youth, this gentleman suffered very much from headaches, which were followed by partial loss of hearing, and were probably occasioned by some morbid change in the bones at the base of the cranium. The pains have long since ceased, but the deafness remains. There is one other circumstance in his medical history which deserves to be mentioned. At the age of nineteen he was troubled by the growth of an indurated tumour from the conjunctiva of the upper eyelid. The tumour enlarged, during twelve months, to the size of a cherry, which it resembled in appearance, and projecting downwards over the eyeball, completely obstructed his vision. Some medical friends, among whom was the late Mr. Walker, of St. George's Hospital, agreed, in consultation, that the tumour should be removed, but, as the patient was a little out of health, and the growth of the disease slow, it was arranged that the operation should be deferred for three weeks, during which time the patient should take some gentle aperient medicine daily. At the end of the three weeks, however, the tumour was so much reduced in size, that the operation was suspended, and in two months it had disappeared entirely.

I am induced to dwell on the speedy and complete absorption of the conjunctival tumour, from the parallel which it meets with in the history of the kelis. When the latter was at the height of its growth, the patient, at the request of a relative, consulted the late Mr. King, of Maddox-street, with a view to an operation, not, the patient distinctly avers, from the inconvenience or annoyance of the disease, but, merely, from the apprehension of its growing larger, and some day becoming troublesome. Mr. King, finding the disease limited to the skin, suggested his leaving it to itself, remarking, that if it ever extended to the deeper tissues, it would then be time to effect its removal. No remedies of any kind have been used, and yet, as we have seen, after attaining a certain amount of growth, a spontaneous absorption has set in which has resulted in the very considerable reduction of its size, and the total cessation of the uneasy symptoms which once existed.

I may add, that my observation of the above disease originated in an accidental exploration of the chest with the stethoscope, in order to determine the state of the heart and its valves.

497. *Treatment.*—Judging from the preceding sketch of the symptoms of kelis, it will be concluded that the disease may occasionally become excessively annoying from the degree of pain which it occasions, from its inconvenient situation in respect of dress or the position of the patient, or from the apprehension of ultimate results to which it may give rise in the mind of the patient, or, indeed, of the practitioner. On the other hand, it is consoling to reflect that the tumour has scarcely ever been known to take on an ulcerative or destructive action, or to attain a dangerous bulk. Nevertheless, the patient may be so anxious for relief as to desire an operation, and then, the question arises, as to the propriety of using the knife. Alibert and Rayer have both mentioned the possibility of the spontaneous disappearance of the disease, and one of my cases was an apt illustration of the fact. On the other hand, although excision may have been successful in one or two instances, yet, in the majority, the operation has been followed by a reappearance of the disease in the cicatrix, and, consequently, in a position more unfavourable than that of the original affection. The secondary kelis has also been generally found to be more active in growth and more painful than its predecessor. In Dr. Warren's case, the diseased structure was twice excised; and after the second operation he thus describes its appearance:—The tumour was "about two inches long, and half an inch wide, of a slightly red colour, raised from the surrounding skin like the scar of a burn, and a small red projection extending from its edge. A burning and shooting was felt in the parts. At each of the points where the needle was passed through, there was a little rising similar to the first, and about the size of a pea, and quite red, so that, instead of one tumour, there were seven." In a case recorded by Alibert, in which the kelis was removed, the wound was many months before it healed, and the disease returned with more intensity than before.

The conclusion which naturally results from these observations is unfavourable to operative procedure, and in no case, as it appears to me, is an operation warrantable until every chance of relief by other means has failed.

The treatment heretofore pursued has been chiefly local. Alibert remarks, in his octavo work, that he had been successful in curing two cases by cautery with nitric acid; but, as, in a reprint of the same work, he omits this observation altogether, and speaks unfavourably of all kinds of treatment, I am inclined to think that the disease must have reappeared in those cases. Rayer inclines to the use of pressure, and, in an instance that came under his care, considers that some benefit resulted from this plan; he also alludes to the failure of excision and cauterization. Biett thinks that frictions with hydriodate of potash might be found advantageous; and Cazenave and Schedel are of opinion that the sulphur vapour douche has been beneficial in softening the tumours.

For my own part, I prefer, after regulating the general functions of the system, the maintenance of a steady course of Donovan's solution, in doses of ten drops three times a-day; or of the protioduret of mercury in combination with guaiacum and the oxysulphuret of antimony. The false kelis I have succeeded in removing by means of three-grain doses of the iodide of potassium three times a-day, and a Plummer's pill at bed-time.

Locally, the best applications are collodion, and the tincture of iodine.

CHAPTER X.

HYPERTROPHY OF THE PAPILLÆ OF THE DERMA.

498. THERE are certain abnormal states of the cutaneous textures, the external signs of which are an increase in the growth of the skin without any appearance of inflammation. For example, there are those prominences which are known by the name of warts, and those other thickenings and indurations of the surface of the body which are termed callosities and corns. The most obvious character of these enlargements is the accumulation of epiderma, not diseased epiderma, as in some of the preceding affections, but an epiderma in nowise, except thickness, differing from that of the rest of the body. Now, the epiderma, it is well known, depends for its thickness upon the papillary layer of the derma, being considerable when the papillary layer is highly developed, and *vice versâ*. Hence an unusual thickening of the epiderma is an evidence of an abnormally developed or hypertrophous condition of the papillary layer upon which it is fashioned and rests. This is precisely the pathological state of the diseases comprehended in the present group. The papillæ of the skin are unnaturally enlarged; in the case of warts, without any apparent cause; in the case of corns in consequence of the irritation caused by pressure; and their enlargement is associated with an augmented formation of epiderma. I have already had occasion to remark, that in lepra and psoriasis there exists an hypertrophied condition of the papillæ of the skin, but the enlargement is associated with other morbid conditions which give a specialty to those diseases.

There is another form of hypertrophy of the epiderma, consequent on a previously diseased state of the part of the body upon which it occurs, which I have also included in this group, under the name of pachulosis. In the first edition of this work, pachulosis was described under the title of ichthyosis spuria.

499. The diseases included in this group are therefore—

Verruca.	Clavus.
Tylosis.	Pachulosis.

VERRUCA.

Syn. *Warts.* *Sessile warts.*[1]

500. A wart is a state of hypertrophy of the papillæ of the derma,[2] attended with an increased production of epiderma. (Plate 6, figs. 1, 2.) Warts are usually of small size, and of a rounded figure; sometimes, however, they appear in the form of bands several lines in breadth, and of variable length. They are generally insensible, rough to the touch, and their medium projection from the surface is about a line. They may be developed at any period of life, but are most frequent in children and elderly persons, and arise without any apparent cause, to continue for the rest of life, or disappear unexpectedly. Their usual seat is the hands; less commonly they are seen upon the trunk of the body, or the face.

Hypertrophy of the papillæ of the derma in the production of warts takes place without apparent cause, and without premonition. The papillæ, for the extent of a line, more or less, gradually increase in length, and constitute a small tuft. Each of these papillæ forms around itself an epidermal sheath, and these epidermal sheaths are held together in the form of a bundle by the epidermal mesh formed between and around them by the bases of the hypertrophied and the surrounding normal papillæ. It very rarely happens that the whole of the papillæ included by the area of the wart are elongated; several of them retain their natural size, and these contribute to the production of the inter-fibrous epidermal mesh.[3] When warts have grown to some length their extremity becomes rough, and the fibrous structure of the wart is distinctly apparent; it not unfrequently happens that warts of long standing split and break up in the direction of these vertical fibres.

The structure of a wart is also shown by making a succession of horizontal sections of its mass; by this means the longest papillæ will be cut across, and a slight oozing of blood will take place; and if the sections be continued, more and more of the apices of the papillæ will be divided. The structure of a wart is also well exhibited by thin sections cut horizontally and vertically, and examined under the microscope with a lens of low power.

Rayer compares warts formed of isolated papillæ very aptly to "coarse plush." He quotes from M. Rennes a remarkable instance of a wart of great extent, and presenting the appearance of a band: "a band of agglomerated warts, from eight lines to an inch in breadth, extended from the upper and anterior part of the right side of the breast, underneath the clavicle, along the arm and fore-arm of the same side, till it reached the carpus, where it increased considerably in breadth, and finally overspread the whole palm of the hand."

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[1] Under the name of *Verruca achrochordon*, a pedunculated wart is described by some authors. This is an error; warts according to the above definition are hyper-formations of epiderma, but the pedunculated warts are invariably productions of the derma, and in many instances, as I have ascertained, the emptied tegumentary sacs of small sebaceous tumours.

[2] My researches into the structure of warts date as far back as 1830, when my attention was directed to their nature by a remarkable bleeding wart, which I had at that time on my finger. Since this period, their structure has been investigated by Ascherson, (*Casper's Wochenschrift*, 1835,) and more recently by Dr. Gustav. Simon, of Berlin (*Müller's Archiv.*, 1840.) The latter writer speaks doubtingly of their origin in all instances by hypertrophied papillæ, and states that they arise sometimes where there are no papillæ. I differ entirely from him in this opinion.

[3] This interfibrous mesh is not present in all warts; when it is absent, the fibres adhere but slightly by means of their surfaces, and are kept together by the thick rim of epiderma which surrounds them.

501. *Causes.*—Warts frequently originate without apparent cause; at other times, they seem to depend on local irritation of the integument. Such causes are, want of cleanliness, contact of foreign substances, exposure to cold, &c. Some persons exhibit an especial predisposition to the development of these productions. It is popularly believed that the blood proceeding from warts is capable of exciting their growth in unaffected persons. Such a supposition is too absurd to deserve further attention.

502. *Treatment.*—Warts are easily removed; the way to proceed in effecting this object is to cut off the top of the wart, and touch it daily with nitric or strong acetic acid; removing from time to time the stratum of disorganized and hardened epiderma with the knife. When acetic acid is used, the more speedy destruction of the wart is obtained by keeping it in a state of maceration by means of a vinegar compress. The cure is accomplished in a few weeks. Other substances capable of effecting the same object, but more slowly, are, the nitrate of silver, tincture of iodine with an excess of the metal, the juice of the chelidonium majus, &c.

Mr. Plumbe recommends the use of a small piece of blistering plaster laid on the crown of the wart, and covered by adhesive plaster.

TYLOSIS. CLAVUS.

Syn. *Callosities. Corns.*

503. A corn is an increased degree of thickness of the epiderma, resulting from hypertrophy of the papillæ of the derma; this hypertrophy being determined and kept up by the irritation caused by undue pressure and friction on the part affected. So long as the causes which first gave existence to the corn continue, the epiderma accumulates, and by its pressure on the vascular derma may give rise to ulterior and serious consequences. But as soon as the pressure and friction are removed, the derma regains its natural state, and the epiderma ceases to be produced in abnormal quantity. The ordinary seat of corns is the feet; they may, however, be developed on every part of the body.

Corns present us with three modifications in relation to structure and degree, which I shall consider as varieties; these are,—

Laminated corns,
Fibrous corns,
Soft corns.

LAMINATED CORNS.

Syn. *Tylosis. Callosity.*

504. Investigating the manner of development and growth of a corn, we find that wherever a portion of skin is pressed and rubbed

by a hard and irritating substance, as in the case of the integument of the foot by the shoe, and particularly when the part itself is unable to yield sufficiently, in consequence of its seat over a bone, to escape the pressure of friction, the vascular rete of the derma becomes congested. If the process were now to cease, the congestion of the derma would subside, and the skin gradually return to its natural state. But instead of ceasing, the pressure and friction are continued from time to time, and for some hours together, for months, and even years; the derma becomes more and more and habitually congested, and the papillæ are at first temporarily and afterwards permanently enlarged, the lengthening of the papillæ being most considerable in the centre, where the greatest pressure exists.

The enlargement or hypertrophy of the papillæ of the derma is a perfectly natural process, and the mere result of excitation of the cutaneous nerves in the first instance, seconded by vascular determination to the part, and subsequently, increased vascularity, with the associated consequence, augmented nutrition. With hypertrophy of the papillæ, the function of these organs is likewise increased, and a proportion of epiderma, corresponding with the enlarged papillæ, is produced. The formation of this epiderma over the hypertrophied papillæ constitutes a callosity, or corn, and the thickness of the corn bears an exact relation to the thickness of the epiderma of the surrounding skin, *plus* the increased dimensions and vascularity of the formative papillæ.

[G. Simon contests this explanation of the pathology of corns by a morbid growth of the papillæ of the skin, that each papilla is covered by thickened epidermis, and thinks that Mr. Wilson has either mistaken the middle portion of the corn for enlarged papulæ, or has described a wart for a corn. (Simon, *Die Hautkrankheiten durch Anatomische Untersuchungen erläutert.* 2te Auflage, s. 36, Berlin, 1851.) A successful mode of cure practised by the chiropodists, favours the view, that the mischief is essentially epidermal. They scoop out the centre of the corn by an appropriate instrument; and by means of a forceps lay hold of the portion that remains, jerking it suddenly out. The part removed is long and tapering to a point, and of a structure decidedly horny or epidermal. The moment this is removed, the corn, which previously could not bear the slightest pressure, admits it without inconvenience.]

This is the mode of formation of every corn, and this is the structure which all newly-formed and moderately sized corns present. It follows, from this description, that if we make a vertical section of such a corn, and examine the cut surface with a lens, we shall find the epidermal thickening perfectly homogeneous, and this is the general fact. Sometimes, however, it happens that the section of the corn presents a distinctly stratified texture, and the successive laminæ differ from each other in colour. I have seen the laminæ presenting the various tints of light brown, dark brown, and even black. This peculiarity of structure is easily explained. A more violent pressure than usual, such as that produced by a new boot, or an unusually long walk, upon the enlarged papillæ, has caused an effusion of blood beneath the epiderma, or among the epidermal cells. A new formation of epiderma carries this ecchymosed part towards the surface, and it is seen on the face of a section as a dark lamina. Minor degrees of pressure will give rise to smaller sanguineous effusions, and consequently to lighter coloured or thinner laminæ; and, moreover, the effused and desiccated blood will lose a considerable proportion of its colour as it approaches the surface.

FIBROUS CORNS.

Syn. *Clavus.*

505. The preceding is a sketch of the history of the common laminated corn, or callosity, but those who have paid attention to the subject will have observed in certain corns something more than this. On the summit of the corn they will have remarked an appearance resembling the ends of fibres; in cutting the summit horizontally, there is an appearance as though these vertical fibres were cut across, and they may possibly associate with this appearance the popular belief in the existence of a core and root to the corn. If a vertical and central section be made of a corn of this kind, the existence of vertical fibres, generally slightly different in tint of colour from the homogeneous epiderma, and frequently intermingled with traces of opaque white, is distinctly demonstrated. The explanation of this appearance is as follows:—

The continuance of pressure on the central part of the convexity of the corn causes an undue pressure on the derma, and the common result of pressure on a soft part ensues, the papillæ are absorbed, next the entire structure of the derma is thinned, and after a time even the tissues below the derma are injured by the compression. The part of the derma which in the early stages of the corn was more convex than the rest, now becomes depressed, and instead of being a prominence is a hollow cup of greater or less depth. We have therefore two conditions present in the derma, the bearing of which on the production of the superjacent epiderma is now to be considered. The derma being thinned almost to the state of atrophy, and the papillæ removed by absorption, the epiderma is necessarily *altered in structure;* it becomes horny and of a deeper colour than the surrounding cuticle. In the second place, the secreting surface having lost its plane position and become concave, the epiderma is *altered in direction*, and the continuity between the cup-shaped layers corresponding with the depression of the derma, and those of the plane surface around is disturbed. It is this alteration of direction, and the uprising of the edges of the layers corresponding with the rim of the cup, on the surface of the corn, which produces the appearance of fibres; the whole mass of altered epiderma constituting the core of the corn.

The art of the chiropodist consists in dislodging the core of the corn from its concave bed, and when this is done it is no uncommon thing to find a drop of serum or pus, and sometimes extravasated blood, beneath its deepest part. When these fluids are removed, the surface of the derma, congested and tender, is seen to be exposed.

The description of a corn which I have now given appertains to one of long standing; in those of more recent formation every degree of transition may be observed, from the simply congested and hypertrophous condition of the papillæ to their progressive and total absorption. The structure of the core of the corn is often apparent on its surface from the gradual wearing away of its summit; this process being equivalent to a horizontal section.

Corns sometimes give rise to serious consequences; by pressure on bursæ, they produce bunions; when seated on joints, they often excite inflammation of the structures entering into the formation of the articulation, exostosis of bones, &c. I once dissected a corn situated on the metacarpo-phalangeal articulation of the little toe, which had made its way into the joint, and had produced absorption of the articulating ends of both bones.

SOFT CORNS.

506. These productions are exceedingly painful and annoying, and more troublesome than the two preceding varieties. They occur between the toes, are always of small size, present no convexity on the surface, and, from being constantly immersed in the perspiratory secretion which collects in the situation of their growth, they are soft to the impression of the knife.

In the mode of formation and growth, soft corns are identical with the preceding. From the pressure of the toes one against another, some point of the skin, either corresponding with or on the soft parts immediately opposite the prominent head of a phalangeal bone, becomes slightly inflamed, and a greater thickness of epiderma than usual is formed. At this stage of growth of the corn, it frequently happens that an increase of irritation gives rise to effusion of a serous fluid beneath the white and thickened epiderma. The epiderma is rendered soft by impregnation with the fluid, and a small aperture is formed in the centre of the disk, through which the serum escapes. I have seen a soft corn remain for several months in this state, during the summer season, the surface of the derma continuing to secrete serum, and the serum being retained, or escaping through the small central aperture. At other times, and when the irritation is less severe, the epiderma is thickened by the addition of fresh epidermal formations to its under surface, until a convex mass is formed, which, by pressure on the papillæ of the derma, effects their absorption, and puts a stop to the continuance of the formative process. If a soft corn be extracted at this period, it will be found to be plano-convex in its form, the plane surface corresponding with the level of the adjacent epiderma of the toe, and the convex surface projecting more or less deeply into the derma.

The soft corn sometimes gives rise to the formation of an ulcer, and, being separated from the adjacent tissues by suppuration, is thrown off. In one case, I saw a sinuous ulcer, excited by a soft corn, extend as far as the phalanx; it was followed by exfoliation of the surface of the bone, and a permanent stiffness of the joint.

507. *Causes.*—The causes of corns are pressure and friction. They

occur at all periods of life, and under various circumstances. On the feet, they are usually produced by the friction and pressure of shoes or boots, which are either too tight or too loose. Between the toes, they result from pressure of these members against each other. They may also be the consequence of club-foot, where parts of the skin unused to pressure are made to support the weight of the body. On the hands, corns are met with as a consequence of the pressure or friction of tools in certain trades. On the knees they result from much kneeling; and are also found on various other parts of the body.

508. *Treatment.*—The treatment of corns offers two indications, one curative, the other palliative. The first consists in the removal of the cause, namely, pressure and friction; and the latter in pruning, from time to time, the horny growth. The first indication may be fulfilled, where practicable, by rest and disuse of the article of dress which occasioned the affection; or by means of plasters of thick soft leather, perforated in the centre by a round aperture that fits the summit of the corn, and relieves it from pressure. Plasters of amadou are well adapted for this purpose. The palliative treatment consists in the removal of the thickened epiderma, either by scraping or filing, after the corns have been well soaked and softened in an alkaline solution; or by cutting, either in the soft or hard state. The chiropodists dissect out the central part of the corn, the root, as they term it, by a patient process of cutting and tearing, leaving the circumference to serve as a circular cushion of protection to the more tender central part.

Other modes of removing the epiderma are, by nitrate of silver, by plasters containing the solvents of albumen, namely, soda and potash, &c. It should, however, be recollected that the formation of a corn is not a morbid process, but simply an augmentation of a natural function, kept up by irritation.

The only cure for the soft corn is its entire removal. This may most easily be accomplished by the help of a pair of scissors; all the thickened epiderma being taken away at the same time. The formation of soft corns may be prevented, and when present they may be rendered bearable, by daily ablution with soap, and by placing a piece of cotton wool between the toes after each ablution.

PACHULOSIS.

509. After certain chronic affections, in which the skin is secondarily involved, particularly that of the lower extremities, the epiderma is produced in abnormal quantity; it becomes thick, dry, and harsh, and cracks into scales of irregular form and size. This appearance of the skin has been admitted by Willan into his description of ichthyosis, and referred to by other writers, under the title of accidental ichthyosis, but it is quite clear, from the description of ichthyosis given in the chapter on the diseases of the sebiparous system, that the present disorder bears no relation to that affection. As an inordinate production of epiderma dependent on hypertrophy of the papillæ of the skin, it has a title to a place in this group, while

its principal character, namely, that of thickening and condensation of the skin, seems to point to pachulosis (παχεσ, crassitudo) as a fitting designation.

This state of the skin occurs for the most part in elderly persons, and not unfrequently after the healing up of an old ulcer of the leg. I have also seen it follow some lasting cutaneous disorders, such as chronic lichen. It is sometimes a sequela of anasarca.

510. *Treatment.*—The treatment of pachulosis consists in sponging the scaly surface with a damp sponge, dipped in fine oatmeal, diligently, for five or ten minutes, and then anointing the surface with the lime-water and oil liniment; adding to this liniment, as the torpor of the skin gradually yields, a few drops of liquor ammoniæ. In the course of a short time, the natural tone of the skin may generally be restored by this treatment.

CHAPTER XI.

DISORDERS OF THE VASCULAR TISSUE OF THE DERMA.

511. UNDER this head I propose to consider two disorders—namely,

Nævus,
Purpura.

The former of these depends, obviously, on *hypertrophy of the vascular tissue of the derma;* the latter, on *morbid alteration of the capillary vessels.* Nævus occupies by right a position among disorders of the cutaneous textures, but purpura is a disease of the entire vascular system, and is admitted into the present classification simply on account of the pathological change involved in its appearance upon the skin, and for the purpose of pointing out the pathognomonic characters by which its confusion with other discolorations of the derma may be prevented.

NÆVUS.

Syn. *Teleangiectasia. Vascular nævus. Erectile tumours. Arterial nævi. Venous nævi. Nævous araneus. Nævus flammeus. Gefässmultermäler.* Germ.—*Signes. Taches de vin.* Fran.—*Mother's marks.*

512. The vascular rete of the derma is liable to become dilated, and to give rise to the formation of red patches and slightly elevated tumours, called *vascular nævi.* Vascular nævi present considerable variety in relation to extent, tint of colour, and tumefaction. Occasionally the vascular dilatation is limited to a mere point, from which several enlarged venules pass off in different directions. This kind of nævus rarely increases in size; it is met with on the face and on

the limbs, and from the peculiarity of its appearance, has been named *nævus araneus.* Proceeding upwards from this nævus araneus, the diseased spots may be found presenting every degree of size, and their dimensions are frequently so large that they have been seen to cover the whole of one side of the face, the ear, and part of the scalp. The tint of colour of vascular nævi is dependent on two conditions—the extent of dilatation of the capillary rete, and the degree of excitation of the vascular system. Thus, if the capillaries be only moderately dilated, so as to offer little impediment to the circulation, and the latter be active, the blood will retain its arterial hue, and the colour of the nævus be brightly and vividly red. If, on the contrary, the vascular rete be dilated in a high degree, the blood will travel slowly through the tortuous tubes, and, assuming its venous character, the nævus will present a purple, and even a livid hue. Intermediate degrees of dilatation, or impediment to the circulation, will naturally produce different tints of red. Similar changes of colour are apparent in the same nævus, under different degrees of excitation of the vascular system. Thus, in a state of repose of the individual, the spot may be only moderately coloured and livid, while, in a state of temporary excitement, the spot will assume a most intense and vivid red. The circumstances which affect the colour, modify also the degree of tumefaction. In a state of repose it is ordinarily flaccid, and probably scarcely raised above the surface; but in a state of excitement of the circulation, it will become tense and tumid. In relation to tumidity, as great variety is met with among nævi as is found in their other characters. Some are not perceptibly raised above the level of the surrounding skin, while others, on the contrary, form prominent tumours.

Vascular nævi, when of small size, give rise to little or no inconvenience; but when large, they are hot, painful, and throbbing. In the latter state, they communicate a distinct pulsation to the finger, synchronous with that of the heart's beat. Vascular nævi are sometimes stationary, but more frequently they increase slowly in size by the gradual extension of the morbid state of the capillary rete to the vessels of adjacent parts. Their growth, however, is not limited to the skin, for they are apt to extend more or less deeply into the subcutaneous tissues. Left to themselves, they will sometimes continue the whole of life, without giving rise to any inconvenient results; at other times they may ulcerate and slough, or throw out a fungous growth, this change being accompanied by repeated hemorrhage, and terminating fatally. At all times the hemorrhage is troublesome, and even dangerous, when vascular nævi are accidentally wounded.

Dupuytren has the merit of first pointing out the analogy of structure of vascular nævi with erectile tissue, and since the announcement of this similarity, they have been commonly termed *erectile tumours.* These nævi have been described from the earliest times as mothers' marks, and have been referred to the influence of moral emotion on the part of the mother during pregnancy. In pursuance of this explanation, we still hear them spoken of, in popular language, as bunches of red and black currants, strawberries, raspberries, blackberries, lobsters, &c., and it is supposed that the mother, in these cases, had a particular longing for the object represented.

From the above description it will be seen that all vascular nævi are identical in structure, and that differences, when they exist, are referrible to more or less dilatation of the vascular rete. Where the rete is dilated to a moderate extent, and the colour of the nævi is brightly red, we may call them, for the sake of distinction, *arterial nævi;* and where the capillary rete is very much dilated, and the colour is blue or livid, we may call them *venous nævi.* The term varicose nævi has been sometimes applied to the latter; but the use of this term is objectionable, for two reasons: in the first place, it would seem to indicate a difference of structure, which does not exist; and in the second place, the term is wanted for those bluish subcutaneous enlargements which consist in a plexus of small varicose veins, and are so frequently associated with varix of larger veins.

As far as my observations have gone,—and I have dissected many vascular nævi,—there is no addition to the normal number of capillary vessels in the affected part. They are enlarged in calibre, with corresponding hypertrophy of their coats, with enlargement of their meshes, with hypertrophy of the intervascular tissue, and dilatation of their appertaining arterial and venous trunks.

513. *Treatment.*—When the nævus is of large size, gives rise to little inconvenience, and advances but tardily in its growth, it had better be left alone, or simply treated with cold and styptic applications, with moderate pressure. When, however, these conditions are reversed, an attempt may be made to destroy it bit by bit, by pencilling a small portion of its surface, from time to time, with nitric acid. In this way, in the course of time, a nævus of large size may be cured.

When the nævus is small, it may be removed by excision, or if it be of moderate size, and danger be anticipated from division of the arteries which supply its base, it may be dislodged by the operation proposed by Mr. Liston, which combines with incision the use of ligatures passed through its base, and firmly tied. This plan has the advantage over all others of getting rid of the morbid structure expeditiously, without the chance of hemorrhage. In certain cases, the ligature passed through the base of the nævus may be used without the incision; if the nævus be extensive or elongated, several ligatures may be required; and in some situations it may be desirable to leave needles in the base of the tumour, and fasten the ligature beneath them; where the tumour is pedunculated, a simple circular ligature may be employed.

The spider nævi, and those of very small size, may generally be cured by introducing into them a point of potassa fusa; while, in some instances, touching the exterior with a caustic will suffice for their destruction.

Dr. Marshall Hall has recommended the breaking up of the vascular structure of nævus by means of a cataract needle with cutting edges, avoiding any external opening, save that through which the instrument has entered. Several instances are recorded in which the carotid artery has been tied for nævi of large extent.

In flat nævi, Dieffenbach recommends the use of a compress of lint to be firmly bandaged on the morbid structure, and frequently wetted with liquor plumbi diacetatis, or a solution of alum. The lint should be disturbed as little as possible, and the compression maintained, if necessary, for several weeks. When the nævus becomes white, flat, and firm, its speedy cure may be expected. This treatment is especially applicable to those cases where, from the extent of the disease, operative procedure is inapplicable. Dr. Behrend of Berlin, prefers the application of strong acetic acid, followed by compresses soaked in vinegar. Under this treatment, the blood is made to coagulate in its vessels; the nævus becomes hard and yellow, and is thrown off in the form of a parchment-like layer by a process of exfoliation.

Numerous methods besides the above have been suggested from time to time for the treatment of vascular nævi, such as vaccinating the vascular growth; applying potassa fusa, nitric acid; injecting them with dilute nitric acid; passing a seton through them; applying the actual cautery, quick lime, tartarized antimony, &c.

PURPURA.

514. Purpura is a morbid state of the capillary system, characterized by the effusion of blood into the different tissues of the body, this effusion giving rise to the formation of sanguineous patches in considerable numbers, and of various size. The capillary vessels of the skin participate in this morbid disposition; hence purpura has obtained a place, by courtesy, among cutaneous disorders. When the sanguineous spots are minute, they are termed *petechiæ*, but when of larger size, *ecchymoses*. The spots of purpura are usually seated in the superficial layer of the derma; more rarely the extravasation takes place beneath the epiderma, and in some cases ecchymoses are formed in the subcutaneous areolar tissue. The colour of the spots varies with the quantity of blood effused, and with their duration; petechiæ are usually red, passing with age through the various tints of purple, livid, reddish brown, and eventually disappearing as yellow stains; ecchymoses, from the larger quantity of collected blood, are of a dark purple at first, becoming by degrees almost black, and then passing through the tints of reddish brown, greenish yellow, and yellow, until they vanish entirely. Both kinds of spots are darker in the centre than at the circumference, fading in the latter into the tint of the surrounding skin.

515. Purpura admits of classification into purpura sine febre and purpura febrilis. Of the former there are five varieties—namely, purpura simplex, purpura urticans, purpura hæmorrhagica, purpura senilis, and pura cachectica.

PURPURA SIMPLEX.

516. In purpura simplex, the petechiæ and ecchymoses are developed without apparent cause, and with but trifling constitutional disorder. They are sometimes simultaneous, but more frequently successive in their appearance, and they occur either on part or upon the whole surface of the body. When successive, they present at the

same moment all the tints of colour characteristic of progressive stages of their duration; and when partial in their occurrence, are usually seen upon the lower extremities. The effused blood is ordinarily absorbed in the course of one or two weeks; but when the disease appears in successive attacks, the spots may continue apparent for several months. When petechiæ occur on the face, they are also seen upon the conjunctiva, and in the mucous membrane of the mouth and fauces.

PURPURA URTICANS.

517. Purpura urticans is recognised by the existence of oval and roundish elevated spots of a light red colour, in combination with the petechiæ and ecchymoses of purpura simplex. The elevated spots bear some resemblance to those of urticaria, and the similarity is further increased by the tingling sensation by which they are sometimes accompanied. The association of urticaria with purpura is not unfrequent, either preceding or accompanying the attack. The prominent spots differ from simple urticaria in their large size, the deeper red or livid hue which they assume at their decline, and also in their association with true petechiæ. This affection appears usually on the legs, and is often attended with œdema of the subcutaneous areolar tissue. It is the least serious of the forms of purpura, and is prolonged by successive attacks for about a month.

PURPURA HÆMORRHAGICA.

518. Purpura hæmorrhagica is a much more severe form of disease than the two preceding, and is characterised by a hemorrhagic state of the entire system. This disposition is shown in the occurrence of hemorrhage from the mucous membranes; there is bleeding from the nose, bleeding from the mouth, with spongy gums, bleeding from the fauces, hæmoptysis, hæmatemesis, hemorrhage from the intestinal canal, hæmaturia, and metrorrhagia, one or other of these hemorrhages being predominant in different cases. The ecchymoses and petechiæ are more abundant upon the skin than in the simpler forms; they are general in distribution, and the susceptibility to extravasation is so great, that ecchymoses occur from the slightest pressure. Considerable bleeding follows the most trifling wound, and collections of blood frequently form beneath the integument.

Purpura hæmorrhagica is accompanied, and often preceded, by disorder of the digestive organs, by pains in the head, loins, and pit of the stomach, nausea, constipation, and great lassitude and languor. Its duration is uncertain; where it is likely to terminate favourably, it may continue for a lengthened period; but where it tends to a fatal close, the legs become œdematous, and effusions take place into the serous cavities. Death is not unfrequently sudden in its consummation, from repeated and abundant loss of blood.

PURPURA SENILIS.

519. Dr. Bateman has applied this designation to a kind of purpura which he observed a few times in elderly women. "It appears," he says, "principally along the outside of the arm, in successive dark purple

blotches, of an irregular form, and various magnitude. Each of these continues from a week to ten or twelve days, when the extravasated blood is absorbed. A constant series of these ecchymoses had occurred in one case during ten years, and in others for a shorter period; in all, the skin of the arms was left of a brown colour. The health did not appear to suffer; nor did purgatives, bloodletting, (which was tried in one case, in consequence of the extraordinary hardness of the pulse,) tonics, or any other expedient, appear to exert any influence over the eruption." I have seen these cases repeatedly in old women, but have not deemed them of sufficient importance to require treatment. Rayer remarks that he has observed them in old persons of both sexes, and continues, that they last longer than a month. He adds, moreover, that these cases must not be confounded with true purpura affecting the aged.

PURPURA CACHECTICA.

520. Under the designation of purpura cachectica are included all those cases in which petechiæ and ecchymoses occur upon the skin, as the consequence of a reduced and debilitated state of the system, from whatever cause the latter may arise. We frequently see instances of this kind during the last stage of various diseases, as of dropsies, or whenever the venous circulation is obstructed.

PURPURA FEBRILIS.

521. Purpura febrilis is denoted by the well-marked fever, and general constitutional disorder by which it is preceded and accompanied. All the ordinary symptoms indicating morbid disturbance of the nervous system are present—namely, pains in the head, back and limbs, rigors and sense of oppression; the pulse is quick, there is nausea and vomiting, constipation, a dry tongue, and diminished secretions. On the third or fourth day from the invasion of the precursory symptoms, petechiæ and ecchymoses begin to appear in the skin, and continue to be formed until the body is more or less covered with purple spots.

When these symptoms are present without hemorrhage from the mucous membranes, the case is one of *purpura febrilis simplex;* but when, as sometimes happens, hemorrhages from the different mucous surfaces complicate the affection, it then becomes one of *purpura febrilis hæmorrhagica.*

A variety of purpura is occasionally seen, in which a number of erythematous patches precede the hemorrhagic spots, and upon these, as well as upon the intervening uncoloured skin, the petechiæ and ecchymoses appear.

Febrile purpura may occur at all periods of life, and in every constitution; its ordinary duration is from two to three weeks, and it has sometimes been observed as an epidemic.

522. *Diagnosis.*—The characters already mentioned are sufficient to distinguish purpura from every other disorder affecting the skin. The spots differ from congestions by remaining unchanged under the pressure of the finger, and they may be distinguished from flea-bites,

by the central dark point of the latter, and the surrounding areola. Petechiæ are uniform in colour, and many of them are smaller than flea-bites.

523. *Causes.*—Purpura is a disease of debility of the nervous powers, although not unfrequently associated with increased activity of the arterial system. It occurs at all periods of life, but is most common in children, and particularly in such as are weakly and unhealthy. Occasionally it is met with in persons who enjoy an apparently sound health; or it may be developed in association with constitutional disorder, as in small-pox, and even after vaccination. It is not unfrequently observed as the consequence of a long continuance of the erect posture. I have lately seen a well-marked case of purpura simplex, affecting both legs as high as the knees in a compositor, otherwise in average health. The disease is sometimes hereditary.

524. *Prognosis.*—Purpura being an indication of debility of the nervous powers, is always a disease of which the sequel must be regarded with anxiety. The favourable indications are those which denote a sound and uninjured constitution, but where the latter is feeble, the prospect is most unsatisfactory. Purpura urticans is the least serious of the varieties; purpura simplex follows next; while the hemorrhagic and cachectic forms offer reasonable grounds for apprehension. Purpura febrilis, though sometimes suddenly fatal from sanguineous extravasation in the brain, is more amenable to treatment than the chronic forms.

525. *Treatment.*—The treatment of purpura is founded on the general principles of management of constitutional disorders. If the subject be strong and plethoric, bleeding is followed by the best results, and should be aided by antiphlogistic remedies and regimen. When, however, the tone of the nervous system is obviously deficient, tonics and acidulated drinks are indicated. The treatment proposed by Willan is too exclusively tonic; purgatives are always indicated by the nausea, constipation, and pain at the epigastrium, which attend the disease; and a course of purgative remedies will, in most cases, bring the case to a successful issue. Purgatives have the advantage of being applicable in a debilitated as well as in a robust state of system. The stools in this disease are, without admixture with blood, of a very dark colour, and exceedingly offensive. In purpura febrilis, bleeding, succeeded by antiphlogistic medicines, is attended with great benefit, and is often indispensable.

The general treatment of purpura sine febre should be accompanied by the use of the cold plunging or shower bath, if the patient can bear it, and if not, of sponging the surface of the body with water containing salt or vinegar. Tepid sponging with water containing vinegar, is also applicable in the febrile variety.

Accidental hemorrhages complicating purpura must be treated according to the general principles usually applicable to similar cases, unconnected with this disease.

Mr. Plumbe has given an excellent digest of cases of purpura, with their treatment; his observations on this subject are deserving of attentive perusal.

CHAPTER XII.

DISORDERED SENSIBILITY OF THE DERMA.

UNDER the influence of disordered nervous excitability, depending sometimes on constitutional and sometimes on local causes, the sensibility of the skin may be increased to a morbid extent, constituting *hyperæsthesia;* or it may be morbidly altered as well as simply augmented, and give rise to a painful sensation of itching, to which the term *pruritus* has been applied. These disordered conditions of sensation are independent of any local disease, and the skin retains its wonted appearance and structure.

HYPERÆSTHESIA.

526. Hyperæsthesia, or excessive sensibility of the skin, is more common in women than in men, and is generally referrible to hysteria. In an instance of this disorder, at present under my care, the sensitiveness of the skin is so great that the slightest touch with the finger occasions pain; so far as sensibility is concerned, the patient is as though flayed, and utterly incapable of bearing the weight and pressure of her ordinary dress. For several weeks she was unable to lie down in bed, and at present, though much better, the jolting of a carriage occasions considerable suffering. In other respects her health is good, all the ordinary functions of life being performed regularly and properly. In this lady's case there is present a remarkable state of swelling of the skin, which comes and goes with the increase or diminution of its sensitiveness.

PRURITUS.

527. Pruritus is sometimes *general*, but more frequently *local;* of the latter, several forms deserve attention. These are,

Pruritus ani.
" scroti.
" præputii.
Pruritus urethræ.
" pudendi.

GENERAL PRURITUS.

528. In general pruritus, the peripheral extremities of all the cutaneous nerves of the body are, in turn, the subject of altered sensation. The pruritus is excited by the most trivial causes, and continues unabated for hours, depriving the sufferer of every chance of comfort and repose. The only period of the day that persons afflicted with this distressing complaint can look forward to for an interval of quiet, is the morning. As soon as they have taken dinner, or the most trifling stimulus, their worrying tormentor begins. Alteration

of temperature has the same effect; they suffer immediately that they change their dress, and especially so soon as they experience the warmth of bed. Scratching, instead of relieving, serves only to augment the evil, and they are kept in a state of wretched discomfort and excitement during the greater part of the night, to forget their annoyance at last, only in a sleep made irresistible by absolute exhaustion.

It is interesting to remark the extent to which these painful sufferings are subject to the influence of the nervous system. So long as the mind is engrossed with agreeable occupation, or is diverted from the disorder, the morbid sensation sleeps; but the instant the thoughts are turned to the affection, the pruritus is aroused, and rages with severity. The apprehension of an attack will, in this way, often excite it, and every effort for its relief will but prolong its continuance.

The attacks of general pruritus are variable in length of duration; sometimes they continue for hours without alleviation, while at others their periods are shorter, and broken by intervals of calm. The disorder may last for several months, and even for years.

General pruritus is usually the consequence of irritation of one or other of the mucous membranes of the body. In some instances, the gastro-intestinal mucous membrane is in fault; in others, the pulmonary mucous membrane; and in others, again, the genito-urinary. The affection is sometimes associated with amenorrhœa, or dysmenorrhœa, and not unfrequently with pregnancy. In some instances, it is an attendant on jaundice, and is attributed to the presence of bile in the blood.

PRURITUS ANI.

529. Pruritus ani is a severe and distressing itching of the mucous membrane of the verge of, and immediately within, the anus, and of the neighbouring integument. The itching is greatest at night, commencing shortly after the sufferer has retired to bed, and continuing for several hours. There is no trace of morbid alteration in the skin, but sometimes the parts are excoriated by scratching, and a morbid secretion is poured out, which increases the irritation, and gives rise to erythema of the surrounding parts. Unless relieved by treatment, pruritus ani will continue for many months, and even for years.

The *causes* of pruritus ani are numerous, being partly referrible to the state of the constitution, and partly to local irritation. Among those of the latter class are, ascarides, hemorrhoidal swellings, fistula, and chronic inflammation of the mucous membrane of the rectum. The general causes are, sedentary occupation, disordered health, heat of weather, irregularities of diet, cessation of the catamenia, &c. Dr. Lettsom was of opinion, that in certain cases this disease acted as a useful counter-irritant, and he records several instances in which visceral and cerebral congestions were relieved by its attack.

PRURITUS SCROTI.

530. Pruritus scroti is identical in most respects with the preceding affection, and originates in similar causes. It is usually depen-

dent upon the existence of ascarides in the rectum, or upon a morbid and irritating fluid secreted by the abraded skin. In attempts made to relieve the pruritus by scratching, painful excoriations are often produced.

PRURITUS PRÆPUTII.

531. This form of pruritus depends upon irritation, usually excited by morbid secretion from the mucous membrane of the prepuce. The disease originates in neglect, and may be relieved by attention to cleanliness, and frequent alkaline ablutions. It occurs, for the most part, in the summer season, and is exceedingly distressing whilst it continues.

PRURITUS URETHRÆ.

532. Pruritus urethralis occurs at the extremity and along the canal of the urethra in females, and gives rise to great discomfort and annoyance. This troublesome affection usually depends on some irritation of the mucous membrane of the bladder, and is analogous to the pruritus which is experienced at the meatus urinarius of the male in calculus of the bladder.

PRURITUS PUDENDI.

533. Pruritus pudendi is a most distressing affection. It invades chiefly the external labia and the vulva, but sometimes extends inwards along the vagina, giving rise to excessive discomfort, and often exciting symptoms approaching to nymphomania.

This disease affects all ages: I have twice seen it in young children; more frequently it occurs at the period of puberty, or of the cessation of the catamenia. It is sometimes a very distressing accompaniment of pregnancy, invading at about the fourth month or after parturition. Among other causes which have been indicated as originating this disease are ascarides in the rectum, hemorrhoids, and varicose veins of the labia or vagina. Pruritus pudendi is sometimes experienced as a concomitant of lepra vulgaris, when that disease invades the mons veneris, or the parts adjoining the vulva.

534. *Diagnosis.*—Pruritus may be distinguished from prurigo by the absence of the alteration in structure which is characteristic of the latter disorder; and from other affections it is at once recognisable by the sound state of the skin.

535. *Treatment.*—The treatment of pruritus must be general or local, according to the nature of its cause. The general treatment must be directed to the regulation of the secretions; in a debilitated state of the system, tonics are indicated, and sedatives are in most cases indispensable. The diet should be light, easily digestible, and nutritious, and all stimuli avoided. The best local application for soothing the pruritus is a weak solution of acetic acid, or lemon-juice mingled with water.

For the local varieties, constitutional treatment is equally necessary with local. In pruritus ani, if there be symptoms of congestion of the mucous membrane of the bowels, leeches should be applied to the verge of the anus, and the region subsequently fomented. If ascarides be present, they must be destroyed by a quassia or turpentine enema. I have found an opium injection relieve the irritation after all other means had failed. The local remedies most serviceable in pruritus ani are, a weak solution of acetic acid, or bichloride of mercury, solution and tincture of opium, creasote, compresses saturated with liquor plumbi, the nitrate of mercury ointment, &c. The bichloride of mercury is contra-indicated, if there be abrasion of surface.

Besides the general remedies applicable to pruritus ani, a lotion of acetate of lead, of sulphate of zinc, or pencilling with the compound tincture of benjamin, will be found useful in pruritus scroti.

Pruritus urethræ may best be relieved by the application of two or three leeches to the adjoining mucous membrane, followed by poppy fomentations. If these means should fail, cold astringent lotions may be tried.

Pruritus pudendalis especially requires medication adapted to its cause. Where the presence of the fœtus in utero is the only apparent irritation, we must rely upon the restoration of the secretions and the administration of sedatives. If there be heat and dryness of the vulva—symptoms which indicate congestion of the mucous membrane of the vagina—leeches should be applied to the inner surface of the labia, and fomentations of poppyheads, or a cold poultice saturated with liquor plumbi, afterwards used. I have employed the creasote lotion and a solution of the bichloride of mercury with advantage in this form of pruritus. Frequent ablutions with tepid water, containing a small quantity of subcarbonate of soda, supersulphate of alumina, or sulphuret of potash, are also beneficial. In a very troublesome case, when every other remedy had failed, I succeeded in removing the pruritus by the application of a blister upon the upper part of the thigh, near the vulva. M. Trousseau praises the effects of injections as warm as the patient can bear; he remarks, that he has seen great benefit result from the injection of hot water simply; and that the solution of bichloride of mercury used hot has proved successful after years of unavailing attempts with other remedies. Lisfranc recommends, that in cases where the pruritus bears relation to the menstrual periods, several small bleedings should be practised successively, and these, after a few repetitions, he never found to fail. He also advises nitrate of silver in the form of lotion and injection.

CHAPTER XIII.

DISORDERED CHROMATOGENOUS FUNCTIONS OF THE DERMA.

MACULÆ.

536. Under this head, corresponding with the order Maculæ of Willan, are assembled those affections of the cutaneous textures which are characterized by discoloration of the skin. The precise seat of

these alterations is the rete mucosum and papillary layer of the derma. The cause may be referred to three principal conditions; firstly, the original organization of the individual; secondly, alteration of function of the derma without apparent change of structure; and thirdly, alteration of nutrition of the epidermal cells of the rete mucosum.

537. Maculæ may be arranged in three principal groups—namely, 1. Those which are characterized by *Augmentation* of the natural pigment of the rete mucosum; 2. Those in which there is *Diminution* of pigment; and, 3. Those which present a *Morbid alteration* of pigment. To these characters, which are indicative of important differences, both as regards quantity and kind, in the natural pigment of the skin, I propose to add a fourth group, with the view of including that remarkable alteration in the colour of the skin which is produced by the internal use of nitrate of silver. The seat of this discoloration is different from the preceding, inasmuch as it occupies solely the papillary layer of the derma, and may, I think, very properly be considered under the designation of *Chemical coloration* of the skin.

I. AUGMENTATION OF PIGMENT.

MELANOPATHIA.

Nigrities.

538. When we compare the distribution of the pigment of the skin throughout the members of the human family, we are struck by two remarkable extremes of difference, as illustrated in the jetty black of the tropical zone, and the fair complexion of the natives of colder climates. Between these extremes, every shade of tint may be found in intermediate latitudes; and, indeed, by the alteration of the solar influence only, the pigment may be increased in those of fair skin, and, on the other hand, may be diminished in the dark to a very considerable extent; but we require not to proceed further than our own hearths for an illustration of the fact, that the blonde complexion may be rendered dark by the stimulation of the light during the summer months, and the quantity of pigment will be again reduced during the winter season. To state this fact in physiological language, the activity of the functions of the skin is increased during the summer, and under the stimulus of the sun; while in the winter season it is diminished to its minimum. One of the functions of the skin is the formation of pigment; and under the stimulus of light and heat, and of the sun's rays, this function is greatly augmented, and the skin, consequently, assumes a darker tint.

But it is scarcely necessary to remark that the phenomena involved in the functions of the skin are not wholly referrible to external agencies. That which the stimulus of light and of the sun's rays is to the skin, under natural circumstances, the stimulus of morbid action may be in a disordered state of the system. Hence we occasionally meet with instances in which the skin is altered in its colour in a brief period of time, either temporarily or permanently, as one of the consequences of disease, this alteration being confined to a limited region, or being more or less generally diffused over a large surface.

Again, it is clear that especial organization must also contribute very largely to the differences of tint which are observed in the human race. The long winter of the colder climates, or protracted imprisonment in a darkened cell, would not blanch the skin of the negro any more than would the long blaze of light and the intense heat of the torrid zone confer upon the skin of the European the rich jet of the native African. We are yet, however, to learn how far colonisation for number of years might not give rise to these results. It is to especial organization that we must have recourse, to explain the great difference in shade of colour that exists among the inhabitants of the same island, and the differences which we often meet with in different parts of the body of the same individual. In persons of dark complexion, certain parts of the cutaneous surface always present a deeper tint than the rest. One of the natural changes occurring at puberty is the alteration of the skin of the sexual apparatus to a brown colour, more or less deep in different individuals, while, in rare instances, the skin in this region presents a deep black. Haller, in his Physiology, relates a case of this kind. The alteration of colour which takes place in the areola around the nipple of pregnant women is an analogous change. In some persons the cutaneous pigment in the genital region is partial in its distribution, and appears in the form of patches of various size. Again, patches of a darker colour than the surrounding skin, but identical in every other respect, may be developed upon any part of the surface of the integument in individuals of every shade of complexion.

Cases illustrative of Melanopathia.

539. For the following interesting case of general melanopathia I am indebted to Dr. Pereira.

"John Daniels, aged 17, weaver, applied at the London Hospital, on account of the dark colour of his skin. He states that for some months past he has been changing colour and becoming darker; and that his companions have annoyed him by saying that he is changing to a negro.

"His appearance is that of a dark-coloured gipsy. The darkness of the skin, though general over the body, was most marked at the nape of the neck, and least so on the nose and upper lip. His hair is light-coloured, and his eyes gray; these, his mother states, have undergone no change during the alteration of the colour of the skin.

"His mother is remarkably fair, and she tells me that his father is equally so; and that, until about fifteen months ago, the son was considered very fair. The darkening commenced in the summer; but the boy had not been particularly exposed to the sun prior to the change. He worked with his father at weaving, principally of black goods.

"The tint of the skin was brown, and in this respect differed from the slate-colour induced by the use of nitrate of silver. It somewhat resembled that which I have seen induced by the inhalation of arseniuretted hydrogen; but in the latter case the sclerotic coat of the eye was discoloured; whereas in Daniels's case the sclerotica was remarkably white.

"I carefully questioned both the boy and his mother as to the use of medicine, or of any other agent which could have induced this change of colour in the skin, but without avail. The boy had taken no medicine, and, to the knowledge of himself and mother, had been subjected to no deleterious influences.

"The colour obviously depended on some alteration in the quantity or quality of the colouring matter of the skin. It could not depend on the presence of any colouring matter in the blood, since neither the conjunctiva nor the mucous membrane of the mouth was altered in colour.

"The total absence of desquamation and itching readily distinguished the case from melasma (Pityriasis nigra.)

"A blister was applied to the nape of the neck. After it had caused vesication, it was obvious that the dark colour of the skin resided in the derma and not in the cuticle.

"The mother states that the intensity of the colour is not always alike, being sometimes much greater than at others.

"No great hopes being held out that medicine would affect the change going on, the boy ceased to attend the hospital after a few weeks."

540. In a case of melanopathia which I had an opportunity of seeing, through the politeness of Mr. Acret, of Torrington-square, the blackness affected the entire skin, with the exception of the feet and legs as high as the calf. The subject of this curious affection was a young woman, twenty-eight years of age, who had enjoyed good health up to the first of December, 1844. At this date, she suddenly felt unwell, and suffering from nausea, took an antimonial emetic, which failed to procure vomiting. She was then attacked with typhus fever, and was seriously ill for somewhat more than a month, being unable, during the greater part of this period, to sleep, and being frequently delirious. Previously to the illness, menstruation was regular and the menses copious; but since her recovery, she has suffered from amenorrhœa, with much periodical pain, until the last three months. Her health at present is what she styles "good," that is, her strength is not impaired, but she is liable to headache, has an eczematous eruption on the scalp, and delicate appetite.

It was on her recovery from the above illness that the change of colour in the skin was first observed. Her hair and eyes are black, and her complexion was originally that of a brunette; but she has now the colour of an East Indian. The darkest parts of her body are the back of the trunk and the backs of the hands and arms. On the face, the red tint of the cheeks blended with the black, and the yellow of the forehead and nose struggling for mastery with the deeper tint, give her complexion a singularly Indian appearance. And the peculiarity of her colour is heightened by the extension of the blackness to her lips, and in patches to the mucous membrane of the mouth. Even the teeth have a bluish tint, the lips and teeth seeming as if stained by the eating of black cherries. The sclerotic coat of the eyeball is brilliantly white.

On close inspection of the skin, the blackness is seen to be not perfectly uniform; there are small patches in which the depth of colour is greater than in others, the darker coloured spots corresponding with the apertures of follicles. The areola of the nipples approached in depth of colour to a negro-blackness.

541. Another interesting case of partial melanopathia has been communicated to me by Mr. Jackson, of High Wycombe, Buckinghamshire.

"Martha Weston, aged eighteen, came into the Union House in June, 1843, to be confined, being in the last month of her first pregnancy. My attention was directed to her by the matron, in consequence of an unusual darkness of the skin. Upon examination, I found the anterior surface of the body from the clavicles, downwards to about the middle of the thighs, of a negro blackness.

"From the girl's statement I learned that, shortly after she became pregnant, the areola around each nipple looked very dark, but no further perceptible change took place until she quickened, when an evident darkness of the whole breast was visible, extending upwards to the throat, and downwards to the thighs, gradually assuming a deep black colour. Over the hips it extended laterally, but no part of the posterior surface of the body was affected. Her complexion was naturally rather dark, with black hair and eyes. Her health had been always good, neither had she experienced more than the usual degree of irritation resulting from pregnancy. At her labour, I was called in by the midwife to the Institution, in consequence of a presentation of the hand and umbilicus; turning was resorted to, and the girl did well. She left the house a month after her confinement, at which time there was no alteration in the blackness of the skin; but on my last meeting her, about a year afterwards, she assured me it had entirely disappeared."

PIGMENTARY NÆVI, OR MOLES.

Syn. *Pigmentmuttermäler.* Germ.

542. Besides the patches before described, which are even with the surrounding skin, and in every way identical in structure, excepting as regards the increased production of pigment, there are other discoloured spots and patches found upon the integument, which are termed *pigmentary nævi.* The subject of nævus, or mother's mark, does not belong to this division of cutaneous affections; but it is necessary here to allude to the spots in question, on account of their dissimilarity to the rest of nævi, which latter are vascular alterations of the skin (§ 512.) Pigmentary nævi, on the other hand, are not more vascular than the rest of the integument; they are characterized by a yellowish or brownish, and sometimes a black colour, are very slightly or not at all raised above the level of the skin, and are frequently covered with short bristly hairs. The dark colour of these patches evidently depends on augmentation of the pigment of the rete mucosum, and deposition of pigment in the papillary layer of the derma. Pigmentary nævi are various in point of size, being sometimes small, and at other times so large as to cover nearly one half the face, or a considerable extent of the trunk of the body, or of one of

the limbs. They are met with on all parts of the surface, but particularly on the face and back. When they are raised above the level of the adjacent surface, the elevation depends chiefly on the presence of the hair-follicles, and their contained hairs, which give an increased thickness to the skin.

Although perfectly innocuous in their nature, pigmentary nævi are generally unsightly; in such cases, the medical practitioner is appealed to, and it becomes necessary to adopt measures for their cure. For this purpose, all applications, particularly those of an escharotic kind, are worse than useless, for should they, after a painful process, succeed, an indelible scar, more ugly than the mole, is left behind. The only resource left both to the surgeon and the patient is the removal of the spot with the bistoury. When this is effected by two incisions enclosing an elliptical portion of the skin, in the direction of its natural folds, all trace of the operation is speedily obliterated.

II. DIMINUTION OF PIGMENT.

LEUCOPATHIA.

543. As, in the preceding section, we had occasion to reflect upon the production of an excess of pigment in the skin, originating in causes wholly unknown, so now we have to consider an opposite state as regards the pigment—namely, that in which there is a diminution or total absence of this production, *leucopathia*. The former state, when unassociated with disease, is usually accompanied by robust health, and augmented strength in the individual, while, on the other hand, destitution of the natural pigment is indicative of debility of the nervous and vascular systems, and weakness of the physical and moral energies. Diminution of the natural pigment of the skin may be congenital or accidental, and in distribution it may be general or partial.

GENERAL LEUCOPATHIA; ALBINISMUS.

544. Albinoes are met with among all races of mankind, among the dark-complexioned nations of the south, as well as among the fair-haired inhabitants of the coldest regions of the earth. They are remarkable for a congenital and entire absence of pigment, not only in the rete mucosum of the skin, but also in those other parts of the body which are usually characterized by their dark colour. The skin in these persons is of a milk white colour, the hair is blonde, and usually soft and silky; sometimes, however, it is harsh and wiry in texture, and the entire body is covered with a soft white down. The eyes are red, from the absence of pigment in the choroid membrane, and the iris presents a pinkish tint.[1] There is great intolerance of light, the pupil is small, from the contraction of the iris to exclude the luminous rays, and the person bows his head habitually towards the ground, in order to shadow the retinæ as much as possible. At dusk, however, when the luminous rays are fewer in number, the albino rears his brow, and walks erect, his eyes are no longer over-

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[1] In India "the irides are blue and the hair is silvery white." Brett on the Surgical Diseases of India. 1840.

whelmed by excess of light, and he is enabled to see surrounding objects in the night of other men. The albino is usually short of stature, and weakly in his powers both of body and mind.

Albinism is sometimes accidental in its development, arising, without any apparent cause, upon some part of the body, and thence extending to the entire surface. Instances of accidental general leucopathia have only been observed among the natives of Africa.

PARTIAL LEUCOPATHIA.

545. Partial leucopathia,[1] or the diminution or absence of pigmentary secretion upon one or more parts of the body, as a congenital peculiarity, is most frequently observed among the darker races of mankind, in whom it is likely to attract most attention; it also occurs, but more rarely, among the white races. Several instances of the "pied negro" have been recorded, and such defects of development are not very uncommon among the African race. When the patches are seated on the scalp, the hair participates in the change, and is produced of snowy whiteness.

Partial leucopathia is sometimes accidental in its development, occurring without apparent cause as one of the natural changes of the system. A remarkable case of this kind, which happened in a native of Virginia, is recorded in the fifty-first volume of the Philosophical Transactions.

In my "Portraits" of diseases of the skin, is represented the appearance of the skin in a gentleman, who, originally of blonde complexion, became brown (melanopathia,) and subsequently lost the cutaneous pigment on various parts of the body (leucopathia.) Several white patches made their appearance on his face; one nipple was perfectly divested of pigment, while the other was as dark as that of woman far advanced in pregnancy; and, as if to render the case still more remarkable, the lost pigment was accumulated on the side of the trunk in blotches of deep black.

In Europeans, this alteration is most frequently met with on the scrotum of old persons, where it appears under the form of irregular patches, and sometimes of longitudinal stripes. M. Guyon observed partial leucopathia in Algiers, where it is apt to take place in Europeans as well as in the Arabs. Mr. Brett remarks, that in India, partial leucopathia "occurs in circumscribed patches, which are quite insensible, though the disease commences by itching, pain, redness, and other marks of inflammation." These patches are apt to extend over the whole surface of the body.

546. *Treatment.*—In a case of partial leucopathia which came under my observation in a young lady whose health was in other respects very considerably deranged, I had the pleasure of seeing the natural hue of the skin entirely restored by means of tonics and the shower-bath, and by the application of stimulating liniments to the faded spots. Mr. Brett, in his essay on the Surgical Diseases of

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[1] Partial leucopathia and vitiligo have been confounded by several writers on diseases of the skin, and in the first edition of this work were used synonymously. More careful observation has convinced me that they bear no relation to each other whatever.

India, where this disorder is common, observes: "The treatment consists in the exhibition of the asclepias gigantea in combination with alterative doses of mercury and antimony, and topical stimulants. A blister applied to the white patch will be found advantageous. Stimulating the affected part with sulphureous douches and with sulphur ointment and volatile liniments, is also of great advantage. The disease is considered by the natives as incurable."

III. MORBID ALTERATION OF PIGMENT.

547. The affections which may be arranged under this designation are four in number—namely,

Ephelis,
Chloasma,
Lentigo,
Melasma.

EPHELIS.

Syn. *Sun-burn. Sommersprossen.* Germ.

548. The term ephelis (επι ηλιος, the sun) is intended to express that change which is produced on the skin of many persons by exposure to the influence of the sun's rays. This discoloration is developed in small patches of irregular form, and of a variable tint of brown, upon those parts of the body, as the face, neck, shoulders, hands, &c., which are unprotected by dress. The spots of ephelis are most remarkable in children and women, and in persons possessing a thin and delicate skin. They disappear during the winter season.

Peter and Joseph Franck indicate a difference of appearance in the spots by the terms *ephelis umbrosa*, and *ephelis lentigo*, the former referring to the irregular brown patches, and the latter to circular yellow spots, somewhat resembling those of lentigo. Rayer, moreover, constitutes the mottled appearance seen upon the legs and thighs of women who sit over a charcoal brazier a third variety, under the name of *ephelis ignealis*.

549. *Treatment.*—The best treatment for sun-burn is the application of a liniment composed of equal parts of aqua calcis and oleum olivarum; to which, if the heat of surface be considerable, may be added liquor plumbi in the proportion of twenty minims to the ounce.

LENTIGO.

Syn. *Freckles. Sommersprossen.* Germ.

550. Lentigo has received its name from the lentil-shaped spots which characterize the affection; in popular language they are called *freckles*. Freckles are small, round, yellow, or greenish yellow spots, of various size, but rarely larger than the diameter of a split pea. They are seated in the rete mucosum, and are most abundantly distributed upon those parts of the body which are exposed to the influence of the light, as the face, the neck, the hands, &c. On these parts they are sometimes assembled in thick clusters, which form

patches of considerable size, and are very unsightly. They are also met with on those regions of the body which are usually protected by the dress.

Lentigo is sometimes a congenital affection, appearing soon after birth, and continuing for the rest of life, or subsiding and disappearing at the age of puberty. Sometimes the spots vanish at other periods, and without appreciable causes. They are almost peculiar to persons of light complexion and hair, and are especially frequent in those whose hair is red.

The diagnosis between lentigo and ephelis is the permanence of the former, its independence of season, and its accustomed seat in the skin of persons of light complexion. Ephelis, on the other hand, disappears during the winter, is excited by the sun's rays, and occurs in persons of all complexions.

551. *Treatment.*—The treatment of lentigo consists in the application of some moderately stimulating therapeutic agent, which may excite the skin to a more healthy function. The lotion of bitter almonds containing five grains of the bichloride of mercury to the half pint is well adapted for this purpose; or a weak solution of citric acid in infusion of roses. I have seen the liniment of lime water and oil, with a small quantity of liquor ammoniæ also of use in this unsightly affection.

CHLOASMA.

Syn. *Pityriasis versicolor.* Willan. *Maculæ hepaticæ. Leberflecke.* Germ.

552. Chloasma is characterized by the development of one or more patches, of irregular form and size, and of a pale or saffron yellow, or brownish yellow colour, upon any part of the surface of the body, particularly on the face, neck, and trunk. The seat of discoloration is the rete mucosum; it is accompanied by a slight degree of local inflammation, and lasts from a few days to several months or years.

Chloasma first makes its appearance in the form of small spots, of a dull, reddish colour, which increase in size, and present a yellow tint, approaching more or less to a saffron, or brownish yellow hue. These spots are at first distributed irregularly upon the cutaneous surface; they then enlarge and communicate with each other, so as to form patches of considerable extent. Indeed, these patches are sometimes so extensive that they may be mistaken for the sound skin, while the intervening parts of the natural hue may be regarded as the discoloured integument. They are frequently developed without accompanying symptoms; at other times, they are attended with considerable itching, which continues throughout their course, and gives rise to great annoyance; for the more the parts are scratched, the greater the itching becomes. The pruritus is greatly increased by mental emotion, by impending catamenia, by stimulating food or drink, and by the warmth of bed, and is often exasperated at the latter period to such a degree as to deprive the sufferer of sleep. When the disease subsides, desquamation of the epiderma ensues, and is repeated several times after the total decline of the symptoms.

The symptoms above detailed apply to chloasma when recent and in an active state; when chronic, it gives rise to very little inconvenience. Its location on the skin offers some little variety. In women, I have generally observed it on the front of the chest, on the abdomen, and pit of the stomach; in men, it seems most frequently to occupy the abdomen, running upwards along the sides of the trunk to the armpits and back of the neck, and downwards into the groins and inner parts of the thighs. In one gentleman it affects also the bends of the elbows; and, in another, is situated only on the back, extending downwards on the trunk to the waist. On examination with a lens, there is a conspicuous alteration and elevation of the skin, and a mealy and pulverulent desquamation, resulting from the fact of the hyper-pigmentous cells being more friable and less adapted to assume the condensed character of the scales of healthy epiderma.

553. *Diagnosis.*—There is little danger of mistaking chloasma for any other cutaneous affection; its yellow colour, the troublesome pruritus, and the mealy epidermal exfoliation, are its characteristic signs. In pityriasis there is a more altered and rougher state of the skin; a greater degree of redness; a mixture of soreness with pruritus after scratching, and larger scales.

554. *Causes.*—Chloasma may occur at all ages, and in both sexes, but is most frequent in women, and particularly in those who possess a fair and delicate skin. The most frequent cause of the affection in females is uterine irritation, induced by impending catamenia, amenorrhœa (maculæ amenorrhœicæ,) pregnancy (maculæ gravidarum,) &c. It is by no means uncommon to observe chloasma a short time previously to the appearance of the catamenia, but the disease ceases as soon as the latter are established. In like manner, the affection sometimes lasts through a considerable period of pregnancy, invading at its commencement, and terminating in its course; or commencing at a later period, and ceasing after the completion of parturition. Other exciting causes of chloasma are, gastro-intestinal irritation, stimulating food and drinks, hepatic irritation, &c.

Dr. Gustav Simon places chloasma in his sixth group of diseases of the skin, which he entitles *Parasites;* considering this eruption as depending, like favus, sycosis, and alopecia circumscripta, upon the presence of a parasitical vegetable fungus. I do not agree with him in this opinion; and have failed to discover any vegetable organisms, although I have searched for them with care.

555. *Treatment.*—The indications for treatment are, the removal of the cause, and soothing the local disease. In effecting the first object, the usual remedies for uterine excitement must be employed, when the uterus is the erring organ; for irritations of the alimentary canal, gentle laxatives will be required, with diluents, and abstinence from stimulating diet. The medical treatment, where no such constitutional cause is apparent, should consist of sulphur, in drachm doses, once in the day, internally; and a sulphuret of potash lotion. I have also derived benefit from sulphur ointment, and from the nitric oxide of mercury ointment.

In two cases, occurring in adult men, I adopted a tonic aperient course, followed, as soon as the digestive organs were relieved, by the liquor arsenicalis in doses of five minims three times a day with perfect success.

MELASMA.

Syn. *Pityriasis nigra.* Willan.

556. Melasma is an alteration of the chromatogenous function of the skin analogous to chloasma, and differing from the latter only in the darker colour of the abnormal pigment. Melasma is a rare disease, and has been chiefly observed in persons of weakly constitution. It makes its appearance in the form of blackish patches, of irregular size, upon one, or several parts of the body. The affected skin is dry, and granular to the touch, and the epiderma cracks and desquamates in furfuraceous scales. On the fall of the morbid epiderma, the newly-formed membrane usually presents the normal tint.

Willan observed this affection in children born in India, and brought to this country, and regarded it as a variety of pityriasis; *pityriasis nigra.* In Willan's cases, the disorder "commenced in a partially papulated state of the skin, and terminated in a black discoloration, with slight furfuraceous exfoliations. It sometimes affected half a limb, as the arm or leg, sometimes the fingers and toes." Alibert describes and delineates it as a discoloration of the skin, under the name of "ephelide scorbutique;" and Rayer assigns to it the title under which it is considered in this place. The latter author remarks on its frequent occurrence in association with pellagra, and observes that it "appeared among a certain number of individuals of both sexes, and of all ages, in the epidemic of Paris, in 1828."

The same characters which distinguish chloasma from pityriasis form the principal diagnostic characters of this disease; substituting the yellow tint of the former for the black of melasma.

557. *Treatment.*—The indications for treatment are the same as in chloasma.

IV. CHEMICAL COLORATION OF THE DERMA.

OXIDE OF SILVER STAIN.

558. Persons who have taken nitrate of silver for a certain length of time are liable to be affected with alteration of colour of the skin. In the first instance, this alteration consists in the suffusion of the surface with a bluish tint, which subsequently becomes of a greenish slate colour. The discoloration takes place upon all parts of the surface of the body at the same time, but is most remarkable in those regions which are exposed habitually to the influence of light, as the face and hands; and, in the latter situations, it not unfrequently assumes a more or less deep black. The colour is curiously modified in certain localities by admixture with red; hence, in the conjunctiva, and on the lips, it presents a livid brown tint, and on the general surface it is much deepened by those causes which, under other circumstances, would produce pallor; for the same reason, the discoloration is more apparent upon persons naturally pale than in those who possess a fresh complexion.

Once established, the discoloration produced by nitrate of silver lasts for the entire life of the individual, without alteration. In some few instances only it has been observed to diminish slightly in the course of years.

Treatment.—Few persons afflicted with this deformity would feel disposed to endure it calmly, without making some attempt at its removal; hence, it becomes necessary to inquire what remedies might be employed with the best chance of a successful result. The iodide of potassium has been proposed for this purpose; and as in moderate doses it is a safe remedy, it deserves a trial, and may be continued for a length of time. Its known powers of removing nitrate of silver stains from the surface of the skin, are suggestive also of its use as a local application. For the same reason, a lotion of the bichloride of mercury, with or without the hydrochlorate of ammonia, is a judicious remedy.

CHAPTER XIV.

DISEASES OF THE SUDORIPAROUS GLANDS.

559. OUR knowledge of the existence and nature of the sudoriparous system is comparatively recent. It was first made known by the researches of Purkinje, Breschet, and Roussel de Vauzeme, and their discovery has thrown much light on the pathology of the sudoriparous organs. It had long been observed by dermatologists, that the perspiratory secretion may become morbidly augmented without fever, and without apparent visceral disease, a disorder which has been termed *ephidrosis.* The sweating sickness which prevailed in England during the sixteenth century, and which still continues to make its appearance from time to time in France, receives much elucidation from our knowledge of the anatomy and physiology of the sudoriparous organs. The observation of this function will probably discover to us also certain morbid phenomena, which may be referred to deficiency of perspiratory secretion, and numerous instances are recorded of alteration in the physical properties of the secretion. So that the diseases of the sudoriparous system may be referred to the three heads which are generally applicable to secreting organs—namely,

Augmentation of secretion,
Diminution of secretion,
Alteration of secretion.

1. *Augmentation of secretion.*

IDROSIS.

Ephidrosis. Sudatoria.

560. Idrosis[1] is an excited action of the sudoriparous glands, at-

[1] Der. ἱδρως, Sudor.

tended with symptoms which indicate inflammatory determination. It is characterized by excessive perspiration, the perspiratory secretion being altered in its qualities; by more or less redness of the skin; by heat, and tingling or itching; and by frequent shooting and lancinating pains. When the disease is general and acute, it is attended with febrile symptoms, and often with the development of serous vesicles, or sudamina. (§ 351.)

561. Idrosis presents two principal varieties—namely,

Idrosis simplex,
" maligna.

IDROSIS SIMPLEX.

Syn. *Ephidrosis. Sudatoria simplex. Sudatoria miliaris. Miliaria. Miliaria rubra. Miliaria alba.*

562. Simple idrosis is a subacute affection, sometimes general, but more frequently partial in its attack. When general, it is apt to be accompanied, after the lapse of three or four days, by sudamina, constituting that form of the disorder termed *sudatoria miliaris*. These vesicles first make their appearance on the neck, then on the trunk and abdomen, and then on the skin of the arm-pits, and inner sides of the thighs. The disorder is accompanied by febrile symptoms, and torpor of the alimentary canal, and its sudden arrest is sometimes followed by visceral congestion. Subacute idrosis usually terminates in a week or a fortnight.

Chronic idrosis is less apt to give rise to constitutional symptoms, and to the production of miliary vesicles. "M. Dupont has published an account of a curious case of a chronic general ephidrosis, which lasted upwards of six years. The woman who was thus affected became pregnant during this time, and was happily delivered of an infant, which she nursed herself. This ephidrosis, which, according to him, was independent of any other affection, after having been fruitlessly combated by various remedies, yielded at last to extract of aconite, given at first in doses of half a grain, and gradually raised till sixteen grains a day were taken."[1]

Partial idrosis is more common than the general form; sometimes it is confined to the feet alone, at other times to the axillæ, perineum, or scalp, and "Hartmann cites the singular fact of a woman who, during pregnancy, perspired only on the right side of her body."[2]

The perspiration in idrosis is acid, disagreeable in odour, and so profuse as to produce softening and opacity of the epiderma, which, on the soles of the feet is often corrugated, like that of washerwomen. The disease is most commonly met with in the summer season, occurring during extreme heat, excessive exercise, &c.

IDROSIS MALIGNA.

Sudatoria maligna.

563. The malignant form of idrosis appears to correspond with the sweating sickness of the sixteenth century—a disorder which is no

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[1] Rayer, Translation, page 920. The extract of aconite here referred to is much inferior in strength to the English alcoholic extract, of which the dose is one-eighth to one-half a grain.

[2] Rayer, loc. cit.

longer met with in England, but which would seem, by the numerous reports made to the Académie de Médecine, to be still prevalent in France. The disease is infectious and contagious, and occurs epidemically. The following brief notice of the disorder is an abstract of the description given by Rayer.

Malignant idrosis is commonly associated with inflammation of the stomach and intestines; inflammation of the lungs; inflammation of the bladder; or inflammation of the cerebro-spinal axis. When the digestive organs are especially affected, the disease is characterized from the commencement, or at an early period, by a severe constriction at the epigastrium, spasm of the diaphragm affecting respiration, distressing anxiety, deeply drawn sighs, feeling of weight on the chest, with a sense and alarm of suffocation, and, in some cases, vertigo, violent headache, and nausea. When the lungs are the seat of inflammation, there is a deeply seated pain in the chest, crepitating rattle in the bronchi, oppressed breathing, frequent full pulse, and sanguinolent expectoration. When the bladder is inflamed, there are pains in the hypogastrium, difficulty in passing the urine, with high colour and deficiency of that secretion. And when inflammation of the cerebro-spinal axis is present, there is headache, flushed countenance, full, starting eyeballs, throbbing temples, contracted or fixed pupil, coma, and convulsions.

These symptoms occasionally prove fatal in twenty-four or forty-eight hours, or the disease may run on for two or three weeks.

564. *Treatment.*—The indications for treatment in idrosis are, to restore the secretions, to allay the irritation of the inflamed perspiratory organs, and to engage with local congestions as they arise. The first of these indications is effected by means of abstinence, diluents, and the ordinary antiphlogistic remedies. The second calls for the use of the warm bath. The third may require general or local bleeding, blisters, mustard plasters, mustard foot-baths, &c.; these remedies being employed according to the seat, and in proportion to the severity of the symptoms. The suggestion of M. Dupont relative to the extract of aconite is worthy of recollection. A sulphureous bath is recommended by Rayer, and in chronic cases sulphureous vapour might be found useful.

After regulating the secretions, tannin will be found a valuable remedy in these cases. I have employed tannin in idrosis of the feet with considerable advantage, conjoining with it chloride of lime as a lotion for local application. A strong solution of alum is also serviceable, and I once saw a gentleman who informed me that he had relieved himself of this discomfort by the use of a brine foot-bath every night.

Cases illustrative of Idrosis.

565. The following three cases of idrosis were observed by M. Marrotte, in the Hotel Dieu, at Paris, at the close of an epidemic of typhus fever, which raged in that city in 1842. M. Honoré, in whose wards the patients lay, had never before seen cases of this disease; and M. Rayer, who is well acquainted with the disorder, had never seen it in Paris.

Case 1.—A young man, twenty-three years of age, was received into the hospital, July 29, complaining of pain in his head, lassitude, great prostration, thirst, and drowsiness. His skin was hot, pulse frequent, tongue and teeth foul; had had no action of bowels, which could only be brought to move by medicine; no rumbling in the iliac fossæ. There were none of the lenticular spots which accompanied the prevailing epidemic. The skin though very hot was neither dry nor burning; on the contrary, it was moist. He complained, moreover, of an uneasy sensation and feeling of anxiety at the pit of the stomach, which led to the administration of an aperient emetic.

The present symptoms have lasted for three days. His first indications of disease were, general uneasiness and loss of appetite, which were not sufficiently pressing to induce him to relinquish his duties. Suddenly, in the middle of the day, he was seized with pain in the head, and great prostration, which forced him to take to his bed, but he had no rigors, no diarrhœa; his skin was at the same time covered with a moderate, though constant perspiration.

For two or three days after admission the patient continued in the state above described, without having been benefited by a bleeding from the arm, practised previously to his application at the hospital. After this period, the disease assumed all its severity, the prostration and drowsiness were more marked, the perspirations and oppression became more intense. The perspiration streamed forth continually from the skin, the heat of skin increased, the pulse became stronger and more frequent, the oppression was accompanied by cough and mucous expectoration, and auscultation discovered mucous râles throughout the whole extent of the bronchi.

This combination of symptoms persisted in all their force for ten or twelve days; at the expiration of that period, the patient felt improved. His amendment seemed in some degree to have been effected by a change in the position of his bed to a better ventilated situation. Under the influence of this change of position, the perspiration diminished, the tongue became soft, moist, and simply furred, the teeth became clean, and the thirst was diminished.

On the 25th of August, the patient is progressing; the surface is still moist in situations where the skin is naturally perspirable. Vesicles are dispersed about the neck and trunk, some being filled with a milky serum and surrounded by a slight areola; others being transparent. The return of appetite is more tardy.

566. *Case* 2.—A man, upwards of six feet in height, thirty years of age, had felt, every evening, a sensation of feverishness, for about twelve days; his appetite failed; he suffered from thirst; his skin felt burning hot, and he experienced considerable drowsiness. Since his admission, the fever has become increased and continued; his skin is covered by a constant perspiration; he has headache, pain in the left side, anxiety, and oppression at the præcordia.

In the course of five or six days, the anxiety and oppression have assumed an excessive degree of intensity; he has cough and expectoration, and mucous râles are very obvious throughout the whole of his chest. The perspirations have increased, together with the heat of skin, and the hardness and frequency of the pulse. The abdomen is distended, the tongue thickly furred; there is great prostration, and perpetual drowsiness. An eruption of red pimples appeared upon the neck, and spread thence to the face and trunk; in two or three days these pimples were surmounted by vesicles, containing a lactescent fluid, and were followed by successive eruptions of sudamina, chiefly of the phlyctenoid kind, which occupied the vacant spaces between the papulæ.

As the eruption increased and advanced in development, the oppression decreased, the pulse became softer, and the abdomen diminished in bulk. In this patient, as in the former, the bowels were inactive, and required the aid of medicine. His intellectual powers were unaffected, and the appetite returned gradually to its normal standard during recovery. On the 25th of August he was convalescent.

567. *Case* 3.—A young man, twenty-four years of age, for some time past suffered from uneasiness, loss of appetite, and lassitude, for which symptoms he was bled from the arm without benefit. He was next seized with headache, vomiting, diarrhœa, and perspirations, and was forced to take to his bed, where he remained for eight days, suffering with perspirations during the whole period.

On admission, August 16th, he was in a state of extreme prostration, heaviness was exhibited in his features, his tongue and teeth were covered with sordes, the perspirations were general and continual, his abdomen was distended, and he suffered from thirst. For several days he remained in this state, answering with difficulty the questions that were put to him. He had retention of urine, and upon the passage of a catheter, a full basin of clear urine was withdrawn. In seven or eight days from this time, his state was improved, the stupor has diminished, and the tongue is moist. The perspirations are mitigated, and this mitigation became strikingly apparent as soon as the patient was removed to a better ventilated situation. They have not yet, however, wholly ceased; the hardness and frequency of the pulse have yielded.

From this period, amelioration was as speedy as in the former cases, but the return of appetite was not so marked as is customary after typhus fever; he was not so much emaciated as are patients convalescent from the latter disease, but he appears more debilitated.

M. Marrotte remarks with regard to these cases, on the exacerbation which took place at the close of the fifth or sixth day; the continuous perspirations which existed at that period both day and night; the intensity of the prostration and drowsiness; the cutaneous eruption which at this period made its appearance, but without being critical; the oppression and anxiety at the præcordia appearing with the perspirations; the protraction of amendment to the term of two weeks from invasion; the continuance of perspirations to the close of the third week, and the marked benefit resulting from better air and ventilation; all of which symptoms he looks upon as pathognomonic.

Contrasting the disease with typhus fever, he recalls the negative characters of sudatoria. There was no diarrhœa in the commencement; there were no headache, rigors, or vomitings; the prostration of the physical powers is rarely so great; it is rare that the tongue and teeth are so speedily covered with sordes, or that drowsiness is so strongly marked. The first week passed away without epistaxis, and without lenticular spots. The pulse of sudatoria, again, has never the smallness and frequency of the pulse of typhus.

2. *Diminution of Secretion.*

ANIDROSIS.

568. Diminution of perspiratory secretion from arrest of function of the sudoriparous glands has hitherto been observed only in relation with febrile diseases. It is probable, however, that the perspiratory secretion, like that of other secerning glands, may be diminished and checked as a consequence of inflammatory disorder of the sudoriparous glands, independently of the rest of the organism. The dryness of skin which we occasionally meet with in some individuals bears no reference to the sudoriparous system, but is dependent on the absence of secretion of the sebiparous glands.

Alteration of Secretion.

OSMIDROSIS.

569. Alteration in the physical properties and chemical composition of perspiration, is co-existent with augmentation of secretion, and may also occur independently of increase in quantity. The most apparent alteration in physical properties is that which relates to odour, osmidrosis.[1] The perspiration frequently assumes an acid smell, probably from containing a larger proportion than usual of acetic acid, or a rancid odour, from excess of butyric acid, or a combination of both, constituting a fetid and disagreeable odour, which has been aptly compared by Rayer to the smell of "rotten straw." The same author remarks, "I had a woman under my care in the Hôpital de la Charité, affected with chronic peritonitis, and who, some time before her death, exhaled a very decided odour of musk; the pupil who called my attention to this circumstance had observed the smell for several days, while dressing the patient, who had been blistered, but thought it owing to a bag of musk put purposely into the bed, to overpower other bad smells. The woman, however, assured us that she had no description of perfume about her, and I satisfied myself that her linen, which was frequently changed, was not impregnated with any perfume before being delivered to her from the laundry of the hospital. The odour of musk, the existence of which was fully ascertained by myself and several physicians, and which was very perceptible on the arms and other regions of the body, did not become more powerful from rubbing. After continuing for about eight days, the smell became fainter, and nearly vanished the evening before the patient's death. Speranza[2] relates a similar case.

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[1] Der οσμη, odor.

[2] Observation d'odeur aromatique exhalée par la peau de l'avant-bras. Archives Generales de Medecine. Vol. xxx. p. 399.

Schmidt has inserted in the Ephemerides Naturæ Curiosorum the account of a journeyman saddler, three and twenty years of age, of rather robust constitution, whose hands exhaled a smell of sulphur so powerful and penetrating as very soon to infect any room in which he happened to be. I was once consulted by a valet de chambre, who could never keep a place in consequence of the unpleasant odour he left behind him in the rooms which he had been occupied in cleaning. There have been instances of individuals who, to obtain their discharge, or immunity from military service, have simulated these offensive perspirations, by rubbing their axillæ with the animal oil of dippel, assafœtida, a piece of much decayed cheese, putrid fish, &c."

Another author observes, "the sweat of persons with the itch is said to have a mouldy odour, while that of syphilitic patients is said to smell sweet. The sweat of rheumatic and gouty persons has an acid smell, while in putrid fever and scurvy, it has a putrid odour; in jaundice it is said to resemble musk in its smell. In Stark's General Pathology we find it stated that the odour of the sweat in scrofula resembles that of sour beer, while in intermittent fever it smells like fresh-baked brown bread." "Anselmino found free acetic acid in the sweat of women during their confinement; and, according to Stark, the quantity of free lactic acid is increased in the sweat during scrofula, rachitis, and certain cutaneous eruptions." "Anselmino found a larger proportion of ammonia in the sweat after an attack of gout than in any other case. Behrend states that the sweat in putrid and typhus fever is ammoniacal, and in nervous diseases, according to Nanche, it becomes alkaline. All sweat with a putrid odour probably contains free ammonia. In cases of gouty and urinary concretions, the quantity of phosphate of lime appears to be increased."[1]

570. Dr. Piutti, of Elgersburg, has made some analyses of morbid sweat, the leading feature of which is the absence of the salts of lime. Simon thinks that the phosphate of lime appertains to the epiderma, while Berzelius, more correctly in my opinion, believes it to be a constituent part of the secretion, and held in solution by a free acid. Piutti omits all notice, likewise, of sulphuric acid and potash. The three analyses made by Piutti are as follow:—

	1.	2.	3.
Water	995·5	993·0	994·6
Chloride of sodium	3·0	4·0	3·3
Phosphate of ammonia	·5	·8	1·1
Acetate of ammonia	·5	·6	·5
Hydrosulphate of ammonia	trace	...	trace
Extractive matters	·5	1·6	.5
Specific gravity	1003·5	1004	1003

The first was a man aged thirty-six, suffering from atonic gout; the second was also from a patient with gout; and the third from a girl of twenty-two, labouring under paralysis of the lower limbs.

Of the abnormal constituents which have been found in the perspiratory fluid, are, albumen in rheumatic fever, gastric, putrid, and hectic diseases, and also on the approach of death; blood, uric acid, bilin and biliphæin, uro-erythrin, and fat.

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[1] Simon's Animal Chemistry, Am. Ed.

"The following substances enter into, and have been detected in the sweat: quinine, sulphur, mercury, iodine, iodide of potassium, assafœtida, garlic, saffron, olive oil, rhubarb, indigo, prussian blue, and copper."[1]

571. *Treatment.*—I have several times been consulted in cases of osmidrosis, and have succeeded in relieving my patients from a most distressing malady, by a plan of treatment directed to regulate the secretions and other functions of the body. In one case, where the general means had failed, tannin effected a perfect cure. Locally, the chloride of lime lotion should not be omitted.

CHROMIDROSIS.[2]

572. Numerous instances of abnormal coloration of the perspiratory secretions are scattered through the works of the older medical writers, and through the various periodicals. Cases of blue perspiration[3] have been recorded by several authors. Green perspiration[4] has also been observed. The rarest of the discolorations of the perspiration seems to be that in which the secretion is yellow.[5] Black[6] is not so uncommon; it was probably of the same nature as the disorder described in a future page of this work, under the name of stearrhœa nigricans.

573. *Treatment.*—I have never seen a case deserving of being considered as one of chromidrosis. Were such a case to present itself, I should not doubt of being able to restore the healthy functions of the skin, by regulating the general health, and using stimulants locally.

HÆMIDROSIS.

574. The most common of the morbid discolorations of the perspiration are those of a red hue, which probably owe their peculiar tint to the colouring principle of the blood; hence they appear to me to call for separate consideration. Landerer[7] observed a red perspiration which flowed from the axilla of a patient labouring under fever. Voigtel, also, has noticed an instance of sanguineous perspiration.[8]

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[1] Simon, quoted from Stark's General Pathology, p. 1127; and Baumgärtner, Elements of Physiology and Therapeutics, page 486.

[2] Der. χρωμα, colour.

[3] Conradi. Blue perspiration of one half the scrotum, Anat. p. 292.—Lemery, Histoire de l'Académie des Sciences, 1701. Fontenelle, sur les sueurs bleues; Journal de Chimie-medicale, vol. i., p. 330. Billard, Frorieps Notizen, No. 32.—Dr. Bleifuss in Wurtemberg Med. Correspond. Blatt. 1835. No. 26. The occurrence of blue pus has been noted by several observers; amongst others by Dr. Apjohn, of Dublin, and Dr. Olioli. Dr. Apjohn considered the colour to be occasioned by the presence of prussian blue. In Dr. Olioli's case, M. Bouchardat detected an organic colouring matter of unknown nature. Dr. Semmola has recorded two cases of blue urine. The colouring principle of blue perspiration is probably of a similar nature.

[4] Borellus, Hist. et Obs. Med. Phys. Cent. 2, Observatio 54.—Paullini Cent. 1, observatio 38. John Peter Franck, De curandis hominum morbis. Landerer mentions an instance of green milk, secreted by the peripheral lobules of the mammary gland in a pregnant woman.

[5] Ephemerid. Nat. Cur. Dec. 1. Ann. 6 et 7, Obs. 78.

[6] Bartholinus, Acta. Hafn. 1, Obs. 70.—Ephemerid. Nat. Cur. Dec. 1. Ann. 2, Obs. 19.

[7] Buchner's Repertorium, 2d Series, vol. v. p. 234, quoted by Simon.

[8] Stark's General Pathology, p. 1131.

M. du Gard has recorded the case of a child three months old, that was "taken with a bleeding at the nose and ears, and in the hinder part of the head, which lasted for three days, and afterwards the nose and ears ceased bleeding, but still blood like sweat came from the head. Three days before the death of the child, which happened the sixth day after it began to bleed, the blood came more violently from its head, and streamed out to some distance. It also bled on the shoulders and at the waist." "It bled also for three days at the toes, at the bend of its arms, at the joints of the fingers, and at the fingers' ends."[1]

The greater number of cases of effusion of blood, or of a sanguineous fluid from the skin, occurs in young women, and are referrible to vicarious menstruation. I lately saw a young lady, in whom a discharge of this nature took place every fortnight from four circular spots, each about the size of a half-crown, and situated symmetrically on the face; one being on each cheek, one on the forehead, and one on the chin. In the "medical cases" above quoted, a young woman of eighteen suffered a loss of blood from "her ears, a little after at the points of her fingers, and then at her toes; presently after, at the umbilicus and corner of the eye; several times by sweat, and at length it burst out from the middle of her breast; afterwards in the foot, where the saphena is pricked in bleeding; then at both palms and back of her hands. Two days after, it flowed from her chin, and in the night time from the tip of her tongue, and all this in a fortnight's time." Whenever it flowed from her "breast or other parts like sweat, there was no vestige of an orifice to be seen."[2]

575. *Treatment.*—The treatment of hæmidrosis depending on a hemorrhagic diathesis, must be regulated according to the various indications which present themselves. When the cause is imperfect uterine function, the treatment must be the same as for amenorrhœa.

CHAPTER XV.

DISEASES OF THE SEBIPAROUS GLANDS.

576. THE sebiparous glands are subject to the same pathological laws that govern other secreting glands. The secretion may be increased, diminished, or altered, without manifest disease of the structure of the glands and their excretory ducts. Fourthly, the altered secretion may be accompanied by distention of the tubular structure of the glands, and of their related hair-follicles. Fifthly, the glands, with their immediately adjacent tissues, may be the subject of in-

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[1] Medical Essays, abridged from the Philosophical Transactions, vol. i. p. 52.

[2] Landerer mentions an instance of red milk secreted by a woman suffering under suppressed menstruation.

flammation, the secretion being at the same time more or less altered. Under these five heads I shall proceed to consider the disorders of the sebiparous glands.

I. AUGMENTATION OF SECRETION.

STEARRHŒA SIMPLEX.

Syn. *Sebaceous flux.*

577. Great diversity exists among individuals, in relation to the quantity of sebaceous secretion naturally poured out upon the surface of the skin. In certain instances, we have occasion to remark a great increase of this secretion, particularly during the progress of constitutional affections in which the activity of the cutaneous circulation is excited. When this condition is present, the skin is bedewed with an oily fluid, which is especially abundant on the nose, face, and head, and upon all those parts of the body in which the glands are present in considerable number. The augmented secretion, after continuing a variable length of time, gradually diminishes without requiring medical treatment, and without giving rise to any unpleasant symptoms, further than those which are necessarily associated with the unsightly appearance of a greasy skin. This affection may be often seen in persons otherwise enjoying excellent health, in whom an over-stimulating diet, or some slight disorder of digestion, can alone be assigned as a probable cause.

In more severe cases of the sebaceous flux, the skin is somewhat congested and thickened, the common apertures of the excretory ducts and hair-follicles are enlarged, and the secretion poured out spreads in considerable quantity on the epiderma. This profuse form of the disease is usually met with on the face, continues for a great length of time, and evinces no disposition to improve without medical treatment. Such cases are accompanied by pruritus, and often by severe shooting pains.

Treatment.—Attention to regimen, laxatives, alterative doses of mercury, the fulfilment of such peculiar indications as the state of health of the patient may offer, and moderately astringent lotions locally.

II. DIMINUTION OF SECRETION.

XERO-DERMA.[1]

578. The opposite condition to the preceding is occasionally observed, particularly in aged persons; I have also seen it in children and adults. The natural consequence of diminished function of the sebiparous glands is a disagreeable dryness and harshness of the skin, with their usual accompaniments, cracking and desquamation of the epiderma. This state of the glands sometimes originates in neglect of personal cleanliness, but in most instances is due to natural predisposition. When the former is the cause, the bath, frequent ablutions with soap, and plentiful frictions with a rough towel, are the proper expedients for procuring relief. Indeed, in every case, frequent sponging of the skin and friction are advantageous.

In two cases of this disease, one in an adult, the other in a child, which have come under my observation since the publication of the first edition of this work, I succeeded completely in removing the dryness and roughness of the skin, and restoring it to its natural pliancy. In a third case now under treatment, I hope to be equally fortunate. Both the adults were young men, between twenty and thirty years of age, enjoying, to all appearance, perfect health, and presenting, in the face, no indication of disease. To hear them speak of an afflicting cutaneous disorder seemed strange; but when they bared their arms and showed the shrivelled, parched, and scaly skin of sordid age, the contrast with their face was wonderful and afflicting. In the child the face also was affected, and the little fellow had the wrinkled aspect of an elderly man. The perspiratory secretion was not arrested in these cases, but it was less than natural, and there was a total absence of the oily product of the sebiparous apparatus.

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[1] ξηρὸς, aridus.

579. *Treatment.*—The treatment of this state of the skin may be best illustrated by reference to that pursued in the case of the little boy above referred to. In October, 1844, when I saw him for the first time, I ordered him a soap ablution every night, and the following ointment to be well rubbed into the skin after the bath, and in the morning:—

℞
  Olei olivæ optatæ, ℥iv.
  Ceræ albidæ, ʒij.
Liquefac simul dein adde—
  Mellis, ʒij.
  Olei Crotonis Tiglii, ♏xx.
M.

I also prescribed for him a teaspoonful of sulphur sublimatum, with ten grains of supertartrate and five of nitrate of potash, twice a week. At the end of a month I increased the croton oil to thirty minims; and at the end of a second month, to forty minims. By the conclusion of the third month the skin had almost regained the pliancy and softness of health; the epiderma ceased to crack and break up into dry scales, and the skin was so sound that I was enabled to dismiss him, enjoining a continuance of the soap ablution once a week, with cold sponging every morning, and the daily use of the kheesah.[1] The ointment was now laid aside, as being no longer necessary.

In the case of the adult, I prescribed friction of the diseased skin every morning with a damp sponge dipped in fine oatmeal; a sponge-bath or shower-bath; and after drying the surface, the application with friction of a liniment containing a drachm of liquor ammonia to an ounce of olive-oil. For the face I ordered the lotion of bichloride of mercury, with spirit of rosemary and mixture of bitter almonds. The internal treatment consisted of a draught of sulphate and carbonate of magnesia, with nitrate of potash, every morning; and nitric and muriatic acids in infusion of gentian, twice a day. This gentleman was quite well at the end of six months. More recently, I have used Fowler's and Donovan's solution with advantage.

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[1] The kheesah, or Indian flesh-glove, comes recommended to us by the experience of ages, and certainly offers advantages superior to any other kind of rubber for the skin in existence. It is the glove, or rather mitten, which has been used, from time immemorial, in Hindoostan, Persia, and throughout the East, and by a race of people, both from necessity and luxury, more attentive to the skin than any other upon the face of the globe. The glove was introduced into England by Mr. J. Ranald Martin, of Grosvenor-street, and Messrs. Savory and Moore have succeeded in procuring the manufacture of a similar glove in London. Their imitation is perfect, both in appearance and properties—indeed, is superior to the original; and it is a subject of much satisfaction to me to be enabled to recommend so admirable a contrivance for promoting the health of the body, through the agency of the skin. The glove is made of goat-hair, the material used in the manufacture of the Burruck or Persian glove cloth, of which the Oriental kheesah is composed.

III. ALTERATION OF SECRETION.

580. In addition to simple increase in quantity, it not unfrequently happens that the secretion of the sebiparous glands is altered in its quality. For example, it may be changed in colour, and by its accumulation on the skin form a thin film of a yellow or black hue; or it may be altered in consistence, and after being spread out upon the surface, dry into a hardened crust, which breaks up into fragments corresponding with the linear markings of the skin, the fragments maintaining their adhesion to the epiderma, and increasing in size by subsequent deposition. These states of the sebaceous secretion constitute a small group of cutaneous disorders, which I shall consider under the names of

Stearrhœa flavescens,
Stearrhœa nigricans,
Ichthyosis.

STEARRHŒA FLAVESCENS.

581. In this disorder the abnormal secretion is of a golden or dirty yellow colour, and forms a film on the surface, which gives the skin a coarse and disagreeable appearance. The substance is soft, and may be removed more or less easily from the epiderma; sometimes it can be wiped away with the handkerchief, but at other times adheres very tenaciously. When removed, it is produced again in the course of twelve hours, and in twenty-four hours regains its original thickness. The seat of this affection in the cases which have come under my observation, is the nose and cheeks, and the scalp. The subjects of the disorder on the face were ladies, while the affection of the scalp, though more common in women than in men, I have seen in both.

Stearrhœa flavescens sometimes assumes a chronic character, and the abnormal secretion, instead of being soft and removable by ablution, forms a hard and dense crust, which adheres firmly to the skin, and can only be separated by means of a poultice. The skin also becomes secondarily diseased in consequence of the irritation caused by this crust, and the affection puts on a serious character. A case of this kind is at present under my care, which has existed for six years, and was originally excited by exposure to the heat of the sun.

STEARRHŒA NIGRICANS.

582. The abnormal sebaceous substance poured out upon the skin has occasionally a grayish appearance; and in two instances which have lately come under my observation, was perfectly black. In

other respects—namely, as relates to consistence and thickness—it resembled precisely the deposits which are formed in stearrhœa flavescens.

Examined with the microscope, I found this deposit to resemble ordinary sebaceous substance, but the nuclei of the cells, instead of being colourless, were perfectly black, and every here and there formed masses of considerable size. Indeed they were identical, in point of structure, with the deepest coloured cells of the rete mucosum of the negro skin; the nuclei being composed of an aggregation of granules more or less shaded with pigment. These appearances correspond with what I had previously observed in some black matter removed from the skin of the face by Mr. Gregory Forbes, in a young lady who was under the care of Dr. MacIntyre.

In Dr. MacIntyre's case, the abnormal secretion could be removed by washing, leaving the skin beneath perfectly natural, and was reproduced in the course of twelve hours. In another case of this kind, which occurred to Mr. Teevan, and of which an account, with a drawing of the appearance of the patient, is published in the twenty-eighth volume of the Medico-Chirurgical Transactions, the skin was so sensitive, that the young lady was induced to abstain from any attempt at washing away the secretion; and each fresh effusion was preceded by a pricking and burning heat. The most remarkable features in the case of Mr. Teevan's patient are the suddenness with which the effusion took place after the skin was perfectly cleared, and the occurrence of black vomitings, black dejections from the bowels, and a black pigment in the urine, when the secretion on the face was arrested. The young lady who was the subject of this unpleasant affection had been under the care of Dr. Read, of Belfast, for a severe pain in her side. At that time the cutaneous affection had not attracted much attention, and Dr. Read was of opinion "that it was connected with imperfect menstrual function."

In an analysis of the black secretion from this patient, made by Dr. G. O. Rees, it was found to be composed of carbon, iron, lime, albuminous matter, fatty matter, and chloride and phosphate of soda.

In a case at present under my treatment, the blackness is confined to the eyelids and adjacent sides of the nose, giving to the young lady who is the subject of this annoying affection the appearance of having extensive ecchymosis of the eyelids. When the discoloration is coming on, she has a sensation of fulness about the eyes, with slight indistinctness of vision and a little headache. The discoloration is usually greatest in the evening, and is subject to increase with anxiety or fatigue. When wiped with a cambric handkerchief, the handkerchief is soiled.

It is more than probable that some of the cases of black perspirations recorded by the older writers, were of the same nature as the cases quoted above. The following instance of a similar disorder is published in the Philosophical Transactions, by Mr. Yonge.

583. "A girl, sixteen years old, a daugher of Mrs. Elizabeth Worth, of Plymouth, about the end of April, 1709, had a few hot pimples rise on her cheeks, which bleeding and a purge or two cured.

She continued very well till about a month afterwards, when her face, so far as is usually covered with a vizard-mask, suddenly turned black like that of a negro. This surprising accident much frightened her, especially after some foolish people persuaded her she was bewitched, and never to be cured. By prayers, exorcisms, &c., which they used, in order to relieve the fascination, they increased the passion and terror of mind to a great degree—even to distraction, and then desired my assistance. By the arguments which I used, and some composing anti-hysterical remedies, the violence of her fits became much pacified. I directed a lotion for her face, which took off the discoloration; yet it returned frequently, but with no regularity; sometimes twice or thrice in twenty-four hours, sometimes five or six times. It appears insensibly, without pain, sickness, or any symptoms of its approach, except a little warm flushing just before it appears. It easily comes away, and leaves the skin clear and white, but smuts the cloth that wipes it from the face; it feels unctuous, and seems like grease and soot, or blacking mixed. It has no taste at all. She never had the menses; is thin, but healthful; the blackness appears no where but in the prominent part of her face. There are a thousand eye-witnesses to the truth of this uncommon case. The anomalar blackness of the girl's face is now, (November 1,) divided into a few dark cloudy specks, which appear but seldom, and nothing so livid as formerly."

ICHTHYOSIS.

584. Ichthyosis, the fish-skin disease, is the name which has been assigned to certain scale-like and spine-like formations, which are occasionally met with on the skin, and which occupy a variable extent of surface. I formerly regarded certain of these exodermal productions as hyperformations of epiderma, resulting from enlargement of the papillæ of the derma; while I retained others in the present group, under the designation of Ichthyosis sebacea. I have since prosecuted my inquiries farther into this subject, and I have obtained clear evidence, that all the forms of ichthyosis are of the same nature; that they are, in fact, concretions of altered sebaceous substance.[1]

585. The varieties of the fish-skin disease, admitted by Willan, are two in number, ichthyosis simplex and ichthyosis cornea; names which so ill represent the diseases to which they refer, that I have thought it desirable, for the sake of clearness of definition, to describe them under the apellations :—

Ichthyosis squamosa.
" spinosa.

[[1] G. Simon has carefully examined several cases of ichthyosis, and infers that the most generally received opinion, that the tegumental changes in ichthyosis should be regarded as hypertrophy of the epidermis is correct, and that the assertion of Good and Wilson, that the disease is essentially a morbid secretion on the surface of the epidermis, is not confirmed; and he thinks there is not much question that Mr. Wilson has confounded crusts formed on the epidermis by an abnormally augmented secretion of the sebaceous matter of the skin with those of ichthyosis. (Simon, op. cit. s. 50.)]

ICHTHYOSIS SQUAMOSA.

Fish-skin disease.

586. We call that state of the skin Ichthyosis squamosa in which, after the effusion of the abnormal sebaceous substance in the form of a thin layer, the latter dries and hardens, and breaks in the direction of the linear markings of the skin, into small polygonal portions, corresponding in form with the areæ of the compartments bounded by these cutaneous lines. The small polygonal divisions are increased in thickness by the accumulation of fresh sebaceous secretion; they become discoloured from exposure to dust and dirt, and they assume a brownish or grayish tint, approaching more or less to dirt colour. In the latter state, the small masses have the appearance of scales, closely adherent to the epiderma, hard and dense in texture, and presenting various degrees of thickness. This affection may occur upon any part of the body, but is most frequent on the face, particularly on the forehead and nose, upon the abdomen, and upon the flexures of joints; indeed, upon all those regions in which the greatest number of sebiparous glands exist, and which are most protected from the friction of dress. The scales are sometimes cast from time to time, particularly during the summer season, and give place to others formed by successive concretion; at other times, they remain adherent for months, and even for years.

This affection of the sebiparous glands is generally unaccompanied by signs of local inflammation of the skin. There is, in many cases, no redness and no heat, and when the scales are thrown off, the skin is natural both in colour and texture; in others, the skin is congested and thickened; it is studded with numerous apertures of sebiferous ducts, and frequently painful. By accumulation, the scales obstruct the mouths of the excretory ducts, and the latter become much distended. The disease is rarely accompanied by constitutional symptoms, but in a few cases when general, some degree of gastro-intestinal irritation may be present.

587. In an instance of this affection which fell under my observation about ten years since, I had the opportunity of examining the skin after the death of the patient from visceral disease. In this case, the scales were remarkable for their thickness; after being well washed, they were grayish in colour upon the surface, but white beneath, and evidently consisted of concreted sebaceous substance. On removing a portion of the epiderma by maceration, the ducts of the sebiparous glands and hair-follicles were found distended with inspissated white secretion, and had a very beautiful and brilliant appearance, projecting like cones of pearl from the under surface of the membrane. The derma presented a number of small deep pits, corresponding with these dilated ducts. The mouths of the distended excretory ducts opened upon the surface of the epiderma, some immediately beneath and in the middle of the scales, and others by their borders. In the former situation, they could be seen as small white points through the scale, and still more evidently when the epiderma was separated by maceration.

From the careful examination of this case, of which a preparation is now before me, and of others which I have subsequently observed, I have been led to the conclusion, that the scales, in this disorder, increase in thickness in two ways, firstly, by addition to the free surface by means of the secretion poured out in the linear furrows of the skin, and, consequently, between the scales; and, secondly, by additions successively made to the attached surface by the effusion of inspissated secretion beneath them. In the preparation before me, the growth of the scales by both of these processes is distinctly evident.

588. A remarkable case of this disorder, disseminated in patches over the surface of the head, neck and trunk, is recorded by Dr. Jacobovics,[1] under the erroneous appellation of "tubercles bigarrés," a new variety of molluscum. Dr. Jacobovics' case differs from ordinary instances of this disease, in the longer duration of the malady, its disseminated character, the excoriations which resulted from its continuance, and the presence of inflamed tubercles intermingled with the patches.

The patient, M. N., was a tailor, of bilio-sanguine temperament, fifty-six years of age, the nineteenth child of healthy parents. His mother had a slight cutaneous affection on the neck; a brother had furfuraceous desquamations on the face; two sisters had several small tubercles on the neck and bend of the elbow; a sister's child had a similar growth. At the age of thirty, M. N. was attacked with severe pneumonia, which left him in unsound health for some years. On reaching his thirty-seventh year, the cutaneous disorder first made its appearance; it commenced on the neck in the form of small yellowish spots, beneath which one or more white points, the apertures of sebiferous ducts loaded with secretion, were perceptible. These yellow spots gave rise to pruritus during the summer season, which subsided in the winter. Three years afterwards, on the occasion of a severe mental affliction, the disease showed a disposition to increase, and quickly spread over his neck, breast, and back. The disorder now assumed the appearance of little crusts,[2] having a roundish or irregular figure, and various colour; for instance, some were yellowish-white; others fawn-coloured, and brownish; others again blackish and livid, and covered with slight desquamation; but there was no constitutional disturbance, nothing to induce the patient to apply for medical assistance until the year 1838, when annoyed by the violent pruritus and unsightly appearance of the disease, he presented himself at

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[1] Du Molluscum, recherches critiques, &c., suivies de la description détaillé, d'une nouvelle varieté. Par M. M. Jacobovics. Paris, 1840.

[2] With no better reason, apparently, than that of adhering to the erroneous appellation which he had assigned to this disease, Dr. Jacobovics styles the crusts *tubercles, or tumours*, throughout his essay. They were unquestionably extravascular formations, and mere depositions on the surface. In accordance with this view, I have, in every instance, altered the terms tubercle or tumour to *crust*. Besides, it does not accord with my notions of pathology to admit the possibility of a tubercle, or tumour, being converted, by progressive development, into a crust. But, to agree with Dr. Jacobovics, such a doctrine must be embraced; for, after indicating a number of progressive stages of growth completed by the crust, he remarks, in conclusion,—"Les tubercules bleuâtres et noirâtres, les *croûtes* noires et verdâtres, et les taches qui leur succedent sont des formes secondaires." That is to say, that the black and greenish crusts are the secondary forms of "les tubercles brunâtres." Those who would peruse the statements of Dr. Jacobovics, I must refer to his essay presented to the "Académie Royale."

Saint Louis. He was treated at this hospital for two months without benefit, and he returned to his business. Three months later his case was undertaken by Dr. Jacobovics, and presented the following characters:—

His hair was remarkable for its greasiness, as were several other parts of his body, particularly the skin of the front of the neck, which the author describes as feeling viscous and unusually soft. At the roots of the hair were numerous yellowish patches and scales of sebaceous substance; these greasy scales were also met with dispersed over many parts of the skin. On the forehead, the alæ nasi, the cheeks, the back, and in several other situations, the apertures of the sebiferous ducts were very perceptible, and many of them were obstructed by inspissated secretion, which was dark-coloured in some, yellowish in others, and rose above the level of the surrounding skin in several. In other situations the sebaceous substance retained its softness and whiteness, and distending the excretory ducts, appeared like white points in the midst of the yellowish and discoloured laminæ[1] by which its escape was prevented. The crusts commence by a whitish-yellow or brownish spot, of the diameter of a millet seed or lentil, but without prominence, and pass through a succession of stages which the reporter has accurately detailed. The yellow spot is attended with pruritus, and, examined with a lens, a minute white point may be discerned in the centre of each. In a more advanced stage the yellow spot has increased in diameter, and is raised in the centre, when it presents three or four white points in place of one. By degrees the yellow spots become transformed into brownish crusts, having a maximum elevation from the surface of two lines, and a maximum diameter of six lines. These brownish crusts appear studded beneath the surface with white sebaceous points, which give the mottled (bizarré) character to the production, which awakened in the mind of Dr. Jacobovics the specific designation which he has assigned to the disease. The succeeding stages which the author has observed the sebaceous concretions to assume, are, bluish crusts, punctated with white, and having a lobulated appearance, occasioned by the linear markings of the skin; and blackish crusts, punctated only around the edges, and intersected by deeper furrows, corresponding with the dermal lines. These latter were chiefly met with in the dorsal region; after a time, the linear furrows increase in depth, even to the splitting of the crust into a number of small polygonal masses,[2] which adhere firmly to the epiderma, and assume a deep black colour. The desiccated patches, rubbed by the dress, or scratched with the nails, are liable to excite suppuration of the derma, and the pus, oozing from between the fractured masses, forms upon the surface a succession of irregular crusts, which resemble those of impetigo. Other crusts of a yellowish-green colour are also met with, resulting from the immediate desiccation of the brownish punctated patches, and these also become broken in the direction of the natural furrows of the derma.

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[1] Dr. Jacobovics speaks of patches of a dirty yellow, or yellowish-white colour; these patches he seems to regard as discoloured epiderma, and he describes the white points as being beneath the epiderma. From the observation of cases of this kind, and particularly of the one above recorded (§ 587,) I feel convinced that the yellow patch is a thin layer of inspissated sebaceous substance, adhering very closely to the epiderma; this I conceive to be gradually raised by the deposit of fresh sebaceous matter beneath it, until the elevated crusts are formed, which are the distinguishing feature of this case. The white points will consequently be seen beneath the sebaceous scale. I have already alluded to this appearance, and have before me a preparation in which it is well shown.

[2] The masses are identical with those described at the commencement of this section.

Besides the sebaceous crusts above described, there were interspersed on this man's skin a number of small tumours and tubercles. Some of these were round or oval, prominent in the centre, of a bright red colour, smooth, and shining, covered by a thin and desquamating epiderma, and the seat of a troublesome pruritus. Others were of a bluish-gray colour, with raised and livid borders. These were the principal cause of a violent itching, and indulgence in scratching gave rise to excoriation and chapping of the edges, with a discharge of sero-purulent fluid. A third variety were vividly red, indolent, and of small size, varying from that of the head of a pin to that of a small lentil. But these tumours bore no proportion to the sebaceous crusts. They were, probably, the consequence of irritation caused by the sebaceous concretions, and can only be regarded as a complication of the sebaceous disease.

As regards diagnosis, Dr. Jacobovics, after recapitulating the physical characters of the preceding case—e. g., hereditary tubercles, varying in size from that of a lentil to that of a pigeon's egg (there were none so large in his case,) round or irregular, usually sessile, brownish colour, consistent or softish, generally solid, no constitutional disturbance, &c., remarks, "Among the tuberculous diseases of the skin, none but the present genus is capable of assuming the whole of these characters, so I am bound to establish this in the genus molluscum." An unfortunate preference, for molluscum is already synonymous with heterogeneum. In the treatment of this case the author employed purgatives and warm baths, but with only partial success.

ICHTHYOSIS SPINOSA.

Syn. *Ichthyosis simplex.* Willan. *Porcupine disease.*

589. The spinous variety of ichthyosis is characterized by the formation of hardened masses of altered sebaceous substance, which acquire by growth the form, thickness, and length of short spines. This disease may be developed upon any part of the body, or upon the entire skin, with the exception of the palms of the hands and soles of the feet; the spots of election in the partial kind being the thick skin of the outer sides of the limbs, the convexities of joints, more particularly the elbows, wrists, and knees, and the dorsal surface of the trunk. Ichthyosis spinosa is for the most part congenital; it is associated with a dry skin, in which the perspiratory function is deficient; it is unaccompanied by redness, heat, or local uneasiness, and it endures for a lengthened period, often for the lifetime of the patient. In the earlier periods of the disease the integument is unaffected, retaining its natural softness and pliability; at a later period, however, it becomes thickened and hard from infiltration and deposition, and the morbid action appears to extend deeply into the subjacent tissues. The spines are dense and hard, and for the most part of a dirty brown, or greenish brown colour.

The form and length of the spines in this disease are determined by certain laws, the former depending upon the shape of the small areæ of the epiderma marked out by the furrows of the skin, and the latter upon the powers of the system, and consequent energy of secretion. In illustration of this view, it will be remarked that, of the spines produced upon the convexities of the elbows and knees, where the dermal areæ are large and somewhat quadrilateral, the section has a similar form; while on the anterior aspect of the fore-arms, particularly near the joints, where the areæ are narrow and elliptical, the spines are transversely flattened and slender. With regard to length, I have never seen any of the spines longer than a quarter of an inch; but Willan records instances in which they attained a full inch in some places. They stand out perpendicularly to the surface of the skin, their sides are polygonal, and when the limb is in its natural position, they fit closely side by side so as to present by their free extremities an even and continuous surface. The free ends of the spines are more or less rounded and polished by attrition with the dress of the patient, and the sharp angles of their shafts are rounded off by friction against adjoining spines caused by the movements of the limbs. The base generally corresponds with the small area of skin upon which it is implanted, and to which it is firmly adherent; but by degrees, as the activity of the secreting function subsides, the base becomes reduced to a slender pedicle, and is easily broken off.

590. Examined with the microscope (PLATE 6, fig. 5,) the spines of ichthyosis are found to possess all the general features which might be expected à priori to be present in small cylinders of desiccated sebaceous substance; they are sub-fibrous, and obscurely laminated; the surface is more or less notched and jagged, the apex somewhat split, and the base frequently connected with a broad lamina of exfoliated epiderma. Their internal structure is, however, still more characteristic, for they generally contain imbedded in their substance several minute hairs, sometimes running in a serpentine manner through their entire length, but more frequently coiled and twisted, and evidently fixed in that position previously to their excretion by the sebiferous ducts. These observations lead to the inference which I believe to be true, that the spines of ichthyosis are frequently, if not generally, formed upon the short hairs of the body as they issue from the skin; the hairs being naturally, and as a consequence, very much interfered with in their growth.

This disease is not usually accompanied with constitutional symptoms; the persons affected appearing to enjoy undisturbed health. Sometimes, however, irritation of the mucous membranes is coincident with the cutaneous affection. Willan has observed, that inflammatory pustules or boils occasionally appear on some part of the skin. The epiderma of the palms of the hands and soles of the feet is dry and harsh, and there is frequent scaliness of the face.

591. Willan has pointed out two appearances which the local forms of this disease sometimes present, and distinguished them by the name of ichthyosis cornea. In one of these the spines are curved or twist-

ed, and unusually long, and suggest the idea of miniature ram's horns. In the other the spine is broad and single, and constitutes a horn-like mass. These peculiarities are rare, and no purpose is gained by their separation from the typical disorder.

592. *Diagnosis.*—Casenave and Schedel, who refer to Biett's description of this affection, state that, when it has appeared upon the nose, it has been mistaken for noli me tangere. This error I have seen committed; but it is not one likely to be fallen into by those who examine the scales with attention. The presence of dense scales, or spines, and their regularity of position and form, sufficiently distinguish ichthyosis from every other disease of the skin.

593. *Causes.*—This affection occurs at all ages, especially in persons of phlegmatic temperament, in whom the skin is thin and delicate. It is sometimes accompanied by an unctuous state of the integument, but more frequently by a dry and parched condition of the epiderma, and shrivelled appearance of the skin. Occasionally it has been seen after parturition. The most frequent cause I believe to be the absence of a proper excitation of the skin by ablution and friction.

Ichthyosis spinosa is for the most part hereditary, appearing in the male branches of a family only, as in the instance of the Lamberts, but often originating without any similar disease having been known to exist in the family of the diseased person. In rare instances, it appears a few days after birth, but more frequently shows itself for the first time at the end of two or three months. Rayer alludes to a fœtal monster preserved in the anatomical museum of Berlin, the whole surface of whose body is covered by a layer several lines in thickness, which, being broken up into small pieces, gives it the appearance of a coat of mail. When the disease occurs after puberty, or in the adult, it would appear to be dependent on local and endemic causes. Among these have been enumerated, the ingestion of bad fish, bad water, humidity of atmosphere, &c. Buffon states the disease to be endemic in Paraguay, and several places on the sea coast have, equally incorrectly, obtained a similar reputation.

594. *Treatment.*—The first indication presented to the mind, in considering the nature of ichthyosis squamosa with reference to treatment, is to remove the scaly concretion; and the second, to excite the sebiparous glands to healthy action. The former object is to be effected by means of the warm bath, or warm fomentation, rendered alkaline by subcarbonate of soda or potash, several times repeated. The second may be attained by frequent ablutions with warm or cold water, succeeded by brisk frictions with a rough towel; sea-bathing; and astringent lotions. A useful application to the surface, in this affection, will be found in the following ointment:—

℞
Elder flower ointment, ℥j.
Sulphate of copper or zinc, ℈j.
M. To be used twice or thrice in the day.

The lapis divinus, in the form of lotion or ointment, is also a useful remedy. During the progress of the local treatment, it will be desirable to administer some laxative medicine, and to regulate the diet of the patient.

In ichthyosis spinosa, the spines are to be softened by warm alkaline ablutions or baths, and then some stimulating application made to the skin; such as a lotion containing a drachm of tincture of croton to the half-pint, or a liniment containing a small quantity of liquor ammoniæ. Constitutional remedies, such as the symptoms may indicate, are to be used internally, as alteratives, tonics, &c., and in some instances Donovan's solution will probably be indicated. The liquor potassæ, with decoction of sarsaparilla, may also be tried with expectation of relief. Willan, Bateman, and Elliotson have recommended pitch, in doses of an ounce daily.

IV. RETENTION OF SECRETION.

595. The present group of diseases of the sebiparous glands is characterized by distention of their ducts and related hair-follicles, with more or less alteration in the quality of the secretion, the alteration tending chiefly to inspissation. This group admits of division into two sub-groups, or families, in one of which the excretory hair-follicle still remains open, the secretion is inspissated, and is in communication with the exterior. In the second family the excretory hair-follicle is closed at its aperture, and the escape of the secretion prevented.

(A.) *Retention of secretion in the sebiferous ducts, the excretory aperture remaining open.*

COMEDONES.

Syn. *Grubs. Worms. Mitesser.* Germ.

596. The simplest form of this disease is that which is popularly known under the name of *worms*, or *grubs*. In this affection, the sebaceous secretion is inspissated, and produces complete distention of the related hair-follicle. Reaching the mouth of the latter, the secretion hardens, and becomes deeper in colour, and at the same time, from being exposed to the dust and dirt of the atmosphere, the extremity is rendered dingy and dark-coloured. This discoloration of the sebaceous substance at its extremity gives rise to the appearance of a round black spot, with which, in some persons, the skin of the face, particularly of the nose, is more or less thickly studded. If a fold of skin, including one of these spots, be pressed between the fingers, the concreted secretion is squeezed out, under the form of a little white cylinder, about a line in length, and blackened at its extremity. It is the lengthened form of this little cylinder, with its dark extremity, that has gained for it its popular designation.

Instead of being soft, and easily pressed out from the hair-follicle, it sometimes happens, where the secretion has remained undisturbed for some time, that the little cylinder has become desiccated, and resembles horn, both in appearance and density. In this case, the concretion requires to be dislodged by a pointed instrument, or withdrawn by means of a pair of ciliary forceps. In a remarkable instance of this kind now before me, there are several patches of skin, of about the size of a crown-piece, on different parts of the body, closely studded with these horny comedones, every hair-follicle in the affected area being occupied by its little spine, slightly projecting beyond the plane of the surrounding skin.

The disorder of the sebaceous glands here described is very commonly met with on the face of persons in whom the cutaneous circulation is less active than natural, and particularly among the inhabitants of cities and large towns, in whom the brain and nervous system claim an undue proportion of the vital energies; and in whom congestions of the viscera are not unfrequent. It is generally associated with the presence of other diseases of the sebiparous glands, and is always met with in combination with acne. Indeed, one form of acne, acne punctata, is simply an inflammation of the sebiparous gland and related hair-follicle, excited by the overload of inspissated secretion.

597. When the substance expressed from one of these comedones is examined with the microscope, it is found that the sebaceous mass of which it is composed is altered in its composition. For, instead of flattened epidermal cells or scales intermingled with myriads of oil-globules, which compose the normal secretion, the inspissated substance consists of cells, containing in their interior a granular substance, and a variable number of oil-globules. Besides these cells, several minute hairs are seen in the centre of the mass; they are usually twisted, or bent, and sometimes to such an extent, that the tapering point is approximated to the basial extremity. I have occasionally observed the epidermal follicle surrounding one of the hairs, and more frequently when there exists but one in the sebaceous mass. In this case the bulb of the hair is perfect; its fibrous brush-like root, and the granular mass of the pulp, are distinctly apparent. More frequently, however, the hairs are broken at their larger ends, and the fibrous structure of the hair is very evident. The number of hairs seen in the mass of a comedo appears to have relation to the period of impaction of the sebaceous substance; for when the matter is soft, and of recent collection, I have found only one hair, or at most two, one of the two being surrounded by its epidermal follicle; but when the mass has been impacted for some time, I have counted upwards of twenty. (Plate 3, fig. 18.) Dr. Gustav Simon remarks, that he has seen as many as forty in some comedones.[1]

This observation is an interesting illustration of the physiology of the invisible downy hairs of the body, and serves to prove that which, à priori, we should be led to infer, and indeed that which their presence in the ceruminous substance of the meatus auditorius in such numbers, also testifies, namely, that they are continually thrown off, after attaining a certain length, and continually reproduced. In the instance before us, the pathology of the comedones, the sebaceous secretion is poured as usual into the hair-follicle, but instead of being excreted from thence, and diffused upon the skin, it collects, probably as a consequence of its altered nature, and obstructs the follicle. The little hair, when thrown off by the usual process, is no longer conveyed away from the follicle with the sebaceous secretion, but is sur-

[1] Müller's Archiv., No. 2, 1842.

rounded by the latter in its altered state, and remains enveloped in its substance. By a continuance of this process, a number of hairs may thus be amassed.

Dr. Gustav Simon has recently discovered, in the sebaceous substance of comedones, and in that which is squeezed out from the cones of acne punctata, certain microscopic animalcules, supposed, by the entomologists of Berlin, to be related to the genus acarus; hence, Dr. Simon terms the animalcule, *acarus folliculorum*. A description of this animalcule will be found in a separate chapter, at the conclusion of the volume.

598. *Treatment.*—The treatment of comedones requires the employment of such means as are calculated to stimulate the skin gently, and excite it to the due performance of its proper functions. The parts affected should be impregnated with soap, and thoroughly washed; they should then be rubbed briskly with a rough towel, until the skin be felt to glow; and this should be repeated twice in the day. The immediate effects of this treatment may possibly be a red and patchy state of the skin, which will speedily pass away. It would be well in these cases to extend the ablution and frictions to the entire body, for the appearance of the disease in one part is indicative of a generally torpid action of the skin. Cold bathing and sea bathing are also calculated to be beneficial. In some instances it may be necessary to employ some medicinal stimulant, in which case the following lotion will be found useful:—

℞
Bichloride of mercury, gr. v.
Eau de Cologne, ℥ij.
Distilled water, ℥vj.
M.

or the same quantity of bichloride of mercury may be added to half a pint of the emulsion of bitter almonds.

MOLLUSCUM SIMPLEX.

Syn. *Small sebiparous tumours.* Wilson. *Molluscum contagiosum.* Bateman.
Molluscum sessile; subglobulosum; parvum; pisiforme.

599. In a second group the secretion is not confined to the excretory duct, but distends also the primary ramifications of the former, so as to give rise to a small tumour, about equal in size, in its fully developed state, to a ripe currant. (Plate 6, figs. 6, 7, 8.) This resemblance is not confined solely to size, for the sebaceous substance, rising to the aperture of the follicle in the centre of the tumour, appears like the depression on the summit of the currant to which the corolla is attached, while the sebiferous ducts swell out in the circumference of the tumour, and give it a slightly lobulated appearance. When a transverse section of this little tumour is made, it is found in reality to be divided into five or six segments, each of the segments containing a dilated branch of the excretory duct. The swelling of these segments, moreover, gives rise to a depression on the summit of the tumour, corresponding with the aperture of the duct, from which a portion of the concreted sebaceous substance can always be removed

by means of a pointed instrument, and it also produces a constriction around the base of the tumour.

When these little tumours are left to themselves, they terminate, according to my observation, in one of two ways, either by ulceration of the summit, and discharge of the sebaceous substance and gland *en masse*, (for the latter is but loosely connected with the integument,) or by inflammation and sloughing of the entire tumour. In the former case, the collapsed integument, when the base of the tumour has become much constricted, forms a small, pendulous, pyriform appendage, (verruca acrochordon, § 499,) which remains for the rest of life. In the latter, the ulceration sometimes extends deeply into the skin, and leaves behind permanent and unsightly cicatrices.

600. An instance of this disease lately (March, 1842) presented itself to my notice, which was remarkable for the active development of the tumours. They were first perceived, about fifteen or twenty in number, dispersed upon the skin of the neck, face, and shoulders of a little girl, four years of age. By the advice of the family medical attendant she was sent into the country, and in the course of a few weeks became quite well, all the tumours having disappeared, and no new ones being formed. Soon after her return to town, the mother brought to me her two other children, an infant and a girl of six years old. The mother and children were of blonde complexion, with light hair, and a thin delicate skin; the mother was alarmed at the development of these little tumours on her two other children as well as on herself, "caught," as she imagined, from the child first affected. I quieted her alarms relative to contagion, but was much struck by the fact of the almost simultaneous appearance of the disease upon four members of the same family. On the neck of the mother I found four or five of these little tumours, closely resembling and of the size of currants, constricted at their base, and each presenting an umbilicated depression of impacted sebaceous substance, the aperture of the excretory follicle; and she directed my attention to three ugly scars upon the face left by similar tumours recently healed. On the neck, face, and shoulder of the eldest child I found eight or ten little tumours, presenting all their stages of growth. One upon the shoulder was so completely pedunculated, that I was tempted to place a ligature around it, and in a few days it fell off. On the infant they were less advanced, they were just rising from the integument, and each possessed in its centre the dark point of an excretory sebiferous follicle. The little tumours presented no signs of inflammation, they were of the natural hue, or somewhat lighter than the surrounding skin, from the whiteness of the secretion which they contained in their interior, and there was no areolar redness around their base.

Since the above account was written, I have again (August, 1842,) been visited by this patient, on account of the development of a small angry tumour of a similar kind upon the margin of the upper eyelid of her little girl, involving two or three of the Meibomian glands. With this exception the children have remained free from any return of the tumours. Upon inquiry as to the manner in which they disappeared, the mother tells me, that they became black, and shortly after were rubbed off accidentally. One of large size, and situated behind the ear, in the child first affected, was snipped off by Mr. Tyrrell. The mother, who is out of health, has three still remaining, one of small size near the angle of the right eye, and two upon the back of the hand.

601. Upon examining these little tumours, I found them to present all the characters of a small conglomerate gland,[1] consisting of several lobules held together by areolar tissue, and the lobules composed of ramified ducts and terminal sacculi. The ducts were remarkably dilated, particularly the central one, and were filled with inspissated secretion. The latter was identical in composition with the concreted sebaceous substance of the comedones (§ 596.) The cells were of the same size, had the same appearance, and were intermingled in considerable number with epidermal scales. I differ in opinion with Dr. Paterson in not considering these cells as peculiar organisms, capable of nucleolar propagation when transferred to an appropriate nidus in another individual. I regard them as the normal sebaceous cell, which, as I have before remarked (§ 596,) contains a granular substance, filling it more or less completely.

The difference in the appearance of the cells examined by Dr. Paterson and by myself appears to me to be immediately explained by reference to the physical difference in the contents of the tumours. In Dr. Paterson's case, the contents, as in Bateman's, were milky, and consequently, semi-fluid. Here, then, were the conditions favourable to the production of cells, having a considerable interval filled with fluid between the granulous nucleolar substance and the membrane of the cell—a disposition which induced Dr. Paterson to regard them as being composed of an external vesicle, and an internal vesicle, the latter containing the granular substance. In my cases, on the other hand, the contained substance was concreted, there was a deficiency of fluid, and the granulous substance filled the cell, and in exceptional cases only were any perceived in which a peripheral interval was observed. But on the second day, when the mass had been steeped in weak spirit for a number of hours, the peripheral interval was evident in a considerable number.

On examining my new stock of sebaceous matter, (August, 1842,) fresh from the patient, I found it to consist of cells heaped together like a pile of eggs, and intermingled with a large quantity of epidermal scales in flakes. The mass consisted solely of these two substances, without any granular matter or oil-globules. The cells were variable in their form, some being more or less cuboid, others irregular from compression, some oblong like the eggs of the ant, others, again, oval, but the most common form was ovoid, like that delineated in the figures of Dr. Henderson and Dr. Paterson. The cells presented equal diversity in size, varying in their long diameter from $\frac{1}{909}$ to $\frac{1}{687}$ of an English inch, and in their short diameter from $\frac{1}{1430}$ to $\frac{1}{1111}$: some of the cuboid cells measured $\frac{1}{1000}$; the general size of the oval form was $\frac{1}{860}$ long, and $\frac{1}{1000}$ broad; there were several oblong cells, measuring $\frac{1}{555}$ by $\frac{1}{1429}$; and the common dimensions of the ovoid cells were $\frac{1}{720}$ by $\frac{1}{1000}$. This size corresponds very closely with the cells of ordinary inspissated sebaceous substance, whether it be concreted or pulpy; and also with the dimensions of the epidermal scales lying scattered among the cells. The contents of the cells were also various; some were filled with granular substance, in the midst of which, at some one point, a nucleus was perceptible; others contained a homogeneous substance, separated into polygonal masses, mostly of a cuboid shape; while others, again, were more or less filled with minute oil-globules. It is difficult to say which kind of cells were most numerous. I saw nothing like the double vesicle described by Dr. Paterson, and I think it possible that the appearance which he has delineated may have been produced either in the manner I have already suggested, or by the superposition of a single cell by several connected scales of epiderma; or again, by the accidental position of the cell upon the epidermal scales in such a manner as to constitute a thin margin around it.

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[1] This observation confirms the description given by Dr. Henderson, § 612.

602. *Treatment.*—In the case above detailed, I prescribed laxative medicine, and touched the tumours with nitrate of silver several times. By this treatment I succeeded very speedily in removing them. I have mentioned that a ligature was placed around one; a more expeditious mode of getting rid of them would be to snip them off with scissors. In adults, they may always be snipped off. On the mother of these children I opened several with a lancet, and touched their interior with nitrate of silver. Their return may be prevented by the plan of stimulation of the skin, recommended for the treatment of comedones. Dr. Thomson used sulphate of copper, and Dr. Paterson potassa fusa, in their treatment. In a case which I lately saw under treatment in the wards of St. Louis, M. Lemery employed nitric acid.

In the mode of cure of these tumours, I perceive another argument against their contagious nature. They disappeared in the first child, on the recovery of her health, during a short visit to the country, without local treatment. In the case of the other two children, many of the little tumours fell off, and the disease got well under the use of the compound senna powder. The three at present upon the skin of the mother are attributable to a disordered state of health. Indeed, the family may be said to be the subject of a *sebaceous constitution*, and that any recurrence of disordered health will bring with it a disposition to the formation of sebaceous tumours.

603. After having determined the nature of the small tumours above described, and having assigned to them the position which they appeared entitled to occupy in the natural system of classification of diseases of the skin, I read, for the first time, with attention, the cases narrated by Bateman, under the head of Molluscum, and was struck with the identity of Bateman's cases with those I had just witnessed. Pursuing my inquiry with a view to ascertain the true meaning of the term, and that which seemed to be intended in its original application, I came to the conclusion expressed by Dr. Jacobovics,[1] that Bateman must have borrowed the appellation from the essay of Dr. Lud-

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[1] Du Molluscum, recherches critiques, &c. Paris, 1840.

wig,[1] the reporter of the celebrated case which occurred to Tilesius. The author in his preface remarks—"Rheinhardi, visu fœdum, corpus tectum est verrucis *mollibus* sive *molluscis*." Alibert, Biett, Cazenave, and Schedel, on the contrary, attribute the origin of the term to some resemblance existing between the cutaneous tumours and the knots on the bark of the maple.

The earliest case on record of this affection, and the one in fact which, according to the above supposition, gave the designation to the disease, is that of Tilesius, recorded by Ludwig. I propose to make an analysis of this case, as well as of those which have been published on the same subject to the present time, in order to ascertain the opinions entertained by their respective authors of the cases which have appeared in their names. The result of this inquiry will, I trust, be a confirmation of my opinion respecting the pathology and true position of molluscum.

604. *Case observed by Tilesius.*—John Godfrey Reinhardt was born at Muhlberg, of healthy parents, in 1742. At birth, his body was covered with excrescences of small size. When seen by Tilesius in his fiftieth year, these excrescences varied in size from that of a pea to a pigeon's egg. Their form was various, some being like warts, others oval, others irregular, and others flattened either by the clothes of the patient, or by pressure against an adjoining part. The most remarkable of these excrescences was one which was developed from the integument over the ensiform cartilage; it was wallet-shaped, tuberculated on the surface, flaccid, and hung as low as the umbilicus. Its tuberculated appearance indicates its constitution of several smaller excrescences. The prevailing colour of the tumours is red; here and there one may be seen of a dull yellow or reddish brown hue; they are spongy and soft in texture, and the skin which supports them is dirty-looking and earthy. "*In medio quarundam maximarum excrescentiarum parvum foramen conspicitur, ex quo nigra corpora oblonga, quæ altius in cute albicantem atque tenerum, processum habent, exprimi possunt, quæ vulgo*, comedones, *appellantur*."

The excrescences are most numerous by the side of the vertebral column, on the thorax, the neck, and the sides of the abdomen. On the head, one has the appearance of an encysted tumour. Regularly every month, some of the tumours become congested, and itch greatly, forcing the patient to scratch them violently. He is the subject of habitual feverishness, which is increased at each fresh attack of congestion of the tumours, and is accompanied by loss of appetite.

Reinhardt is short in stature, has a large head, knees somewhat incurvated, protuberant abdomen, and dull expression of countenance. His position in life is one of indigence and misery. He has invariably refused to permit the removal or puncture of one of the tumours, so that their internal structure is entirely unknown.

Such is the case observed by Tilesius. The question now comes to be—What is the nature of the disease? Let us review the evidence. An unhealthy child, born with disordered sebiparous glands, the ducts of the glands loaded with inspissated secretion, and forming small prominences on the surface of the skin. The child bred in "indigence and misery;" the skin "dirt-coloured, and earthy in appearance;" the child and man unsound in body, sluggish in functions. Here, then, are precisely the conditions which we should desire to bring together for the purpose of inducing the disease artificially. For the most conclusive of all evidence, mark the Latin passage quoted from the original; the excretory aperture in the centre of the largest tumours, the altered sebaceous substance squeezed out, nay, more—its comparison with "comedones." One of the tumours situated in the scalp we find to have taken on the usual characters of a sebaceous encysted tumour. The sebaceous tumours in this case are remarkable for being the largest on record. But why? Because they were reared in excellent soil, and because they possessed a growth of half a century. One assumes the form of a wallet, but this we find is the aggregation of several, growing from a limited spot of skin; and one richly supplied with sebiparous glands. The wallet is also favoured in its growth by the constant irritation produced by the pressure of the shoemaker's last. The constitutional symptoms form no part of the disease, only so far that such an abundance of unhealthy glands would necessarily excite general disturbance, and aided by "indigence and misery," and by endemic conditions, would conduce to the development of intermittent fever, under which the patient suffered several times.

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[1] Historia pathologica singularis cutis turpitudinis J. G. Rheinhardi viri 50 annorum, &c. By Dr. C. F. Ludwig. Lipsiæ, 1739.

One other observation is elicited by this case, namely, that no suspicion of contagion appears to have occurred to the minds of any of the persons named in the narrative. The father and mother of the patient never suffered from a cutaneous complaint; his two brothers were free; his two wives were equally exempt, together with an infant child. But this is the typical case of molluscum, with which all future observations must be compared; this is the case which has supplied dermatologists with their definition of the disease—which enabled Bateman to announce that molluscum "is characterized by the appearance of numerous tubercles, of slow growth and little sensibility, and of various sizes, from that of a vetch to that of a pigeon's egg. These contain an atheromatous matter, and are of various forms; some being sessile, globular, or flattish, and some attached by a neck, and pendulous."

None of the tumours were punctured in Reinhardt's case, but that omission is of little moment, when we again advert to the Latin quotation. The tumours from which no sebaceous substance escaped, upon which no aperture was apparent, were undoubted instances in which the excretory aperture had closed, as in encysted tumours.

605. *Cases observed by Bateman.*—This author reports six cases of sebiparous tumours, which he considers, in reference to the case of Tilesius, "a singular species of molluscum." In my opinion, the only difference between Bateman's cases and that of Tilesius is one of duration; and the same observation applies to all the cases recorded since his time. The sebaceous tumours of Reinhardt were of

fifty years' growth. The assumption of the contagion of these cases appears to me as unfounded as in the four cases I have myself related. It will be remarked, that of Bateman's seven cases, three were children of the same family, two were children, apparently, of another family, and two were servants in the first family; one an undoubted case, the other supposititious. But to proceed:—

"The face and neck of this young woman," writes Bateman, "were thickly studded with round, prominent tubercles, of various sizes, from that of a large pin's head, to that of a small bean, which were hard, smooth, and shining on their surface, with a slight degree of transparency, and nearly of the colour of the skin. The tubercles were all sessile, upon a contracted base, without any peduncle. From the larger ones a small quantity of milk-like fluid issued, on pressure, from a minute aperture, such as might be made by a needle's point, and which only became visible on the exit of the fluid. The progress of their growth was very slow; for the first tubercle had appeared on the chin a twelvemonth ago, and only a few of them had attained a large size." "She ascribed the origin of this disease to contact with the face of a child whom she nursed, on which a large tubercle of the same sort existed; and on a subsequent visit she informed me that two other children of the same family were disfigured by similar tubercles; and, besides, that the parents believed that the first child had received the eruption from a servant, on whose face it was observed. Since my attention was drawn to this species of tubercle, I have seen it in another instance—in an infant brought to me with porrigo larvalis; and on investigation, it was found that she had apparently received it from an older child, who was in the habit of nursing it. In this case the milky fluid issued from the tubercles, and may be presumed to be the medium of contagion."

606. *Cases observed by Dr. John Thomson and Dr. Carswell.*[1]— The first case occurred in the Canongate, in April, 1821, in three children of the same family. The eldest boy was supposed to have brought the disease from school, and to have transmitted it to his brother and sister. "The contagious nature of the disease is well evinced in the child. On the back of its hands a considerable number of tubercles are seen, which have been produced by applying them to the face, and scratching those situated there during their inflammatory stage. Some of the tubercles are small, others large; some in a state of active inflammation, others nearly of the same colour as the skin, and quite free from pain. A few of them are pedunculated, but the greater number are attached by broad bases." "The mother, though in the constant habit of nursing the youngest child, has not been infected."

A second series of cases came more recently under Dr. Thomson's attention. A farmer's child was affected with the characteristic little tumours: he had taken the contagion from the child of a farm servant. Some of the tumours were situated on the eyelids, and gave rise to conjunctivitis. While suffering from this disease, the child rested his face against the neck of a servant girl as she tended him, and she, too, became the subject of sebaceous tumours.

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[1] Edinburgh Medical and Surgical Journal, vol. lvi. p. 280. Dr. Paterson's paper.

These cases are narrated in the true spirit of contagion, and with an unconditional assent to the opinions of Bateman. I regret that less attention was bestowed in ascertaining the state of the skin and sebiparous system of the patients, their health, and especially their habits of cleanliness.

607. *Case observed by Alibert.*—Alibert treats of the molluscum of Bateman, under the name of mycosis fungoides, and he associates the disease with the Amboyna and Mollucca pox, with which it bears considerable analogy. His definition is brief, but vague. He observes, "The disease appears upon one or several parts of the body, in the form of fungoid (fongeueuses?) and oval-shaped tumours, which arise and are developed successively upon the face, the upper and the lower extremities. These tumours, which are very analogous in texture with champignons, after having reached their full growth, open like decomposing fruits, and give exit to an ichorous fluid, which is often puriform, and sheds around it a disgusting odour."

The case from which he derives his definition I will shortly narrate. The mother of the patient had upon the face an ulcer that was cured by the application of a caustic; his brother died of a cutaneous disease, which resisted all medical treatment. The man, named Lucas, was fifty-six years of age; his disease was ushered in by a furfuraceous eruption, which was soon after succeeded by the development of small tubercles, smooth and polished on their exterior, and presenting for the most part, the ordinary hue of the skin, some few having a brownish tint. They were distributed over nearly all parts of the body. They resembled morrelles or agarics in form; some were shaped like an olive; and they increased in number to such an extent that fourteen were removed from the face. Their base was large; they were spongy in texture, and they exuded a reddish fluid, which imparted a greenish or yellowish stain to his linen. This fluid concreted on the tumours into the form of a brownish or grayish crust. The majority of the tumours terminated by bursting, and then falling into a flaccid state, leaving in their place a withered skin, which the daughter of the patient removed with scissors, without exciting pain. After experiencing considerable mental affliction, he had an attack of pemphigus. The tubercular disease increased rapidly after this period; the tubercles, on breaking up, gave rise to ulcers; the patient suffered from lancinating pains in these ulcers; he became emaciated and hectic, and died, after keeping his bed for seven months, and being the subject of this disease for five years.

This case is not satisfactory: the seat of the disease in the sebiparous glands is not proved; indeed, Alibert suggests no opinion with regard to the pathology of the tumours, but contents himself with classifying them with the molluscum of Bateman. Examination after death was unfortunately refused: had that been made, I have no doubt that serious visceral disease would have been discovered. I think it very unlikely that the man died of the cutaneous disease.

608. Rayer, who had never seen a case of this disease, remarks, with regard to it, that its "seat appears to be the sebaceous follicles."

609. *Cases observed by Biett.*—Biett, in the "Dictionnaire de Médecine," referring to the case of Tilesius, remarks, that he had seen two analogous cases, but that in these the tumours were hard and consistent, and they contained neither atheromatous matter,[1] nor liquid. He also cites the instance of an old man, whose skin was covered with these little tumours, without any disturbance of his health. Biett met with another form, "non-contagious molluscum," in young women after parturition. In these cases the little tumours were flattened, slightly fissured (*fendillées*) at their summit, irregular in form, and brownish or fawn-coloured in tint. They were indolent, and more particularly distributed about the neck.

Such is the evidence of the distinguished Biett; but with all deference to his judgment, I see in these cases no reason for altering my opinion with regard to the pathology of the tumours. Nor can I perceive any difference between the two forms of non-contagious molluscum, which he seems desirous of establishing.

610. *Cases observed by Cazenave and Schedel.*—These authors relate that they saw, in the Hospital St. Louis, a patient affected with prurigo, on whose body were a number of little indolent tumours. The largest were scarcely so large as a hazel-nut, others were no larger than a small pea. They appeared formed of a dense fibrous substance, and pressure produced no pain. After describing "molluscum non contagiosum," they continue—"molluscum contagiosum is a very rare disease, and does not appear as yet (1828) to have been observed in France. It is characterized by tubercles, rounded, prominent, hard, different in size, smooth, transparent, sessile, giving exit by their summit to a white fluid," &c.

611. *Cases observed by Gibert.*—This author does not conceive it necessary, in his treatise, to describe molluscum, of which he remarks that he has seen but two or three undoubted cases in the course of fifteen years. One of these occurred in the *service* of M. Biett, in a child ten years of age, afflicted with chronic enlargement of the liver and spleen, the consequence of a fall on the abdomen. The entire skin was sprinkled over with small whitish tumours, of about the size of peas. They were hard, indolent, and not unlike those little cretaceous tumours we occasionally meet with in the substance of the liver. M. Biett considered that the disease should be referred to the genus molluscum of Bateman, a rare affection in our climate, but not unfrequent in India.

612. *Cases observed by Dr. Jacobovics.*—In the spring of 1839, this author saw, at Saint Louis, two women, the one sixty, the other seventy years of age, who were covered with fungiform tubercles. To describe these tubercles, would be to repeat the observation of Tilesius. The face, the neck, the head, and the members, were closely set with the morbid excrescences; at the base of the right hypochondrium of one

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[1] By the term "atheromatous matter" is to be understood sebaceous substance altered to the appearance and consistence of pap. The word "liquid" no doubt relates to the "milky fluid" of Bateman. There was no such fluid in my cases; the sebaceous substance was concreted and dense; not soft, as in the case of Tilesius, nor fluid, as in those of Bateman. Biett's appear to have been similar to mine. Since the publication of my first edition, I have repeatedly seen the milky fluid described by Bateman.

patient, and on the neck of the other, one of these tumours was as large as the fist, and shaped like a wallet. The tubercles were red in colour, and the greater part poured out a small quantity of ill-smelling sero-purulent fluid, which every here and there concreted into thin crusts. No other member of the families of these two women had suffered from a similar disease, and on one the eruption had existed for two years. These cases were not further observed.

In his essay on molluscum, Dr. Jacobovics attempts the classification of all the known diseases possessing the general characters of those of Tilesius and Bateman, as three varieties of the genus molluscum. In this attempt he has signally failed; he has succeeded only in bringing together the most heterogeneous materials, under an unmeaning title—a title that would far better be abolished altogether from cutaneous pathology. His three proposed varieties are, *tubercula fongosa*, *tubercula atheromatosa*, and *tubercula variegata*. Under the first of these, which, to illustrate his meaning, should have been *fungiformia*, he has assembled the Amboyna pox, the cases of Tilesius and Alibert, the cancer molluseiforme! of Rayer; the cases of Biett, Cazenave, Schedel, and Gibert, and the molluscum pendulum of Willan. Under the second variety, he groups those cases which have been assumed to be contagious, namely, those of Bateman and Thomson; and he reserves the third designation for his new variety, the "tubercules bigarrés," which I have already transferred to a more appropriate place, namely, the section treating of "inspissated sebaceous secretion, or squamous ichthyosis."

613. *Cases observed by Dr. Henderson.*[1]—Dr. Henderson has seen five cases of this disease identical in their characters with those which fell under my notice, and closely corresponding with those of Dr. Bateman. They all occurred in the children of poor persons; and the finest case was that of an orphan boy, eight years of age, an inmate of a workhouse. Relative to contagion, Dr. Henderson speaks with caution. Three of the children were members of the same family; one was a neighbour's child; the remaining one, the orphan child, was an isolated case. The children who exhibited the molluscum in the most marked degree were very unhealthy, having a tumid abdomen and tubercular deposits. The youngest two, twins, died of acute hydrocephalus, the orphan boy of peritonitis and other serious disease. One of the twins had only two tubercles, the other twelve on the face and one on the ankle; the two other children had only one each, but in the orphan boy there were considerable numbers. They were principally situated on the lower part of the abdomen, the organs of generation, and the inner sides of the thighs; in these regions there were three or four dozen. On the right arm there were four, and on the left ten. They varied in size from a millet-seed to a pea; they were, for the most part, rounded in form, constricted around the base, and had each a small dark-coloured central point, from which might be squeezed a little milky fluid. On the back was an elliptical swelling of large size, measuring one inch and a half in its long diameter, and one inch and a quarter across. In the centre of this swelling

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[1] Edinburgh Medical and Surgical Journal, vol. lvi. 1841, p. 213.

was a small elevation, a kind of crater, and at the apex of the latter an excretory opening, through which might be squeezed a quantity of soft white substance, resembling finely-ground rice, boiled.

Examining the structure of these little tumours, Dr. Henderson found them to consist of vertical cells opening towards the centre, and discharging their contents into a common cavity, which communicated with the exterior by the excretory opening. The large tumour was lobulated in structure, and upon its under surface had the "general appearance of a conglomerate gland;" it illustrated, on a "larger scale, the conformation of the smaller ones." The contained matter of these tumours consisted of nucleated cells, which, according to Dr. Paterson, were about the $\frac{1}{1000}$ of an inch in diameter. Dr. Henderson inoculated with some of this matter, but without producing any result; and he remarks, very justly, that if the disease be considered to be an affection of the sebiparous glands alone, the inoculated substance would not be likely to take effect, unless it was brought in contact with the internal surface of a sebiferous duct.[1] Some excellent figures accompany this paper; numbers 1 and 5 are admirable for their truthfulness.

614. *Cases observed by Dr. Paterson.*[2]—This gentleman records five cases of molluscum contagiosum. The first he saw in a child eighteen months old, robust and healthy, and the daughter of cleanly parents, the father being a fisherman. The little tumours had the pathognomonic form, the constricted base, the central aperture, and the oozing of milky fluid. They varied in size from that of a pin's head to that of a horse-bean, the smaller ones resembling "pearly granulations," (sebaceous miliary tubercles.) They were seated chiefly on the face and neck, and were not painful on being touched. After the appearance of the disease in the child, some tumours of the same character were detected on the breast of the mother at which the child sucked. The bulk of these latter varied from a pea to a hazel nut, and on being pressed, exuded the same milky fluid.

A second instance of these little tumours occurred in a female child of two years old. They were between thirty and forty in number, and were distributed on the neck, shoulders, face, and trunk. Their development is ascribed to being nursed by a girl who had some tumours on her skin.

Dr. Paterson's third instance is not so satisfactory as the preceding; it is that of a young man who had several little tumours on the penis, which he said resembled similar tumours situated on the vulva of his wife.

Dr. Paterson inoculated with some of the milky fluid, but without producing any effect. This gentleman gives an admirable description of the minute structure of these tumours, and of their contents, and a beautiful figure of the disease accompanies his paper.

615. The remarkable case of albuminous sarcoma of the integument of nearly the entire body, described by Mr. Hale Thompson[3] under

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[1] A more effectual mode of inoculation would be to rub the secretion briskly into the skin in a situation where sebiparous glands are abundant.

[2] Edinburgh Medical and Surgical Journal, vol. lvi. 1842, p. 279.

[3] Lancet, vol. ii., 1841. The paper is illustrated with two excellent lithographic drawings.

the title of "albuminous molluscum," and the case of carcinomatous integumentary tumours detailed by Dr. Turnbull,[1] physician to the Huddersfield Infirmary, must be referred to a group, embracing *diseases in the form of tumours affecting the integument in common with other tissues of the body.* They do not, necessarily, originate in the skin; indeed they more frequently take their origin in the subcutaneous textures; they are not limited to the skin, but involve the adjacent tissues, and they are generally met with in other parts of the body as well as the integument.

Since the publication of the first edition of this work, I have repeatedly seen and treated the little tumours described in the preceding pages. Nothing is more easy than their removal, and of their non-contagious nature there cannot be a second opinion.

SEBACEOUS ACCUMULATIONS.

616. In a third group of diseases of the sebiparous glands, characterized by altered secretion and distention of the excretory duct and related hair-follicle, the latter remaining open, the follicle is dilated to an enormous extent, and pressing on the structure of the gland, finally causes its atrophy and absorption. These sebaceous accumulations attain considerable magnitude; they are generally oval in form, and I have seen them measure upwards of an inch in diameter. Their precise seat is the tissue of the derma, and they are more or less flattened by compression between the deep layer of the corium within and the surface of the skin without. The follicular sac is filled with a white and concreted substance, which is more or less apparent through the dilated aperture of the duct. The opening of the duct, however, bears no proportion to the size of the accumulation, and, from the little projection of the impacted substance, is the principal indication of its existence. The walls of the sac are extremely thin, and are lined in their interior with epiderma. Sometimes they are beset with hairs.

On examining the contents of one of these sebaceous sacs, I was much struck by finding the contained substance laminated in structure, and presenting a silvery hue. The lamination of the substance afforded me a convincing proof that the mass was a product of the lining membrane of the sac, and its silvery brilliancy further led me to believe that it must be composed of epidermal scales. The microscope established the correctness of this conclusion. Hence, a disease, originally a disorder of a sebiparous gland, and of its secretion, subsequently becomes one of the hair follicle.

617. *Treatment.*—The concreted substance may be removed, without much difficulty, by means of a small scoop introduced through the aperture. If the aperture be small, it must be dilated or enlarged by means of a trifling incision. After the removal of the concreted mass, the internal surface of the sac should be touched with nitrate of silver.

CORNUA.

Syn. *Horns.*

618. When the sebaceous substance impacted in the dilated sac of

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[1] Edinburgh Medical and Surgical Journal, vol. lvi. p. 463.

a sebiferous duct or hair-follicle in the manner just described, is, by a continuance of the process of formation, forced through the aperture of the sac, it desiccates in that situation, hardens, and is converted into horn. By the addition of fresh layers from below, (the formative power having increased by the removal of superficial pressure,) the indurated mass is still further forced outwards, dilating the aperture as with a wedge, and finally increasing its size to that of the entire base of the hypertrophied follicle. The process of formation of new epithelial layers by the walls of the follicle (now become the base of the mass) will go on, unless interrupted by surgical interference, for years, and in this manner those singular bodies, of which so many remarkable examples are on record, *horns*, are produced.

619. A well marked instance of *horn*, of which I shall now proceed to give an account, was shown to me by my friend, Mr. Barklimore, of Charlotte-street, Bloomsbury-square, during the month of October of the present year (1843.) The patient was an old female servant in that gentleman's family; she was fifty-seven years of age, and gave the following history of her case:—At the age of five-and twenty, on the termination of a severe attack of illness, she observed a small elevation, like a pimple, on the site of the present growth; the pimple increased in size, was somewhat painful, and in about ten years from its first appearance burst, and discharged a quantity of matter resembling "mashed potato." From this moment a cavity always remained, from the bottom of which some "scurfy" matter could be raised by the finger nail. At the beginning of the current year, the present growth made its appearance in the situation of the cavity, and, increasing in size, gave her much pain and uneasiness. The skin around it was red and inflamed, and she applied a poultice, which had the effect, according to her, of making it grow faster. During the summer she suffered much from the frequent jerks which the growth received from her dress, and from awkward blows which it sustained, and in the month of October she applied to her master for relief. At this period the growth had acquired a considerable size: it was situated on the upper and front part of the thigh, and presented the appearance and characters of horn. It was semi-transparent, yellowish in colour, dense and horny in texture, ribbed on the surface, insensible to the pressure of the nail, and firmly rooted in the skin. In general appearance it resembled the broad and curved beak of a bird, of large size, and had a broad and extensive base. Around the base, the integument arose to the height of several lines, and in two places to half-an-inch.. The skin was thin and attenuated, as though from the effects of stretching, the epiderma being continuous with the surface of the horn, and gave the idea of a degeneration of the integument into the horny structure.

On the 12th of October, I proceeded, with the aid of Mr. Barklimore, to remove the horn, by cutting through the integument around its base, and dissecting it from the subcutaneous tissue. The removal was speedily and easily accomplished, since the growth was limited inferiorly by the under surface of the corium.

On examining the horn after removal, I found its base to be formed by the deep stratum of the corium, so that it was obviously a cutaneous formation. The base was oval in shape, and measured in its long diameter one inch and a half, and in the opposite direction one inch and a quarter. The horn was two inches and three quarters in length, by two inches in greatest breadth, and its elevation above the surface was one inch and a quarter. The latter measurement was that of the vertical thickness of the horn; for, in consequence of its mode of growth, its long diameter lay parallel with the surface of the skin. The sebaceous accumulation must originally have formed a prominent tumour, from the side of which the protrusion took place; the thin integument covering the other half still retaining its elevation from distention. Traces of this mode of formation are still apparent upon the surface of the horn. Subsequently, the thin integument has become inflamed and ulcerated, and receiving no granulations from beneath, has desiccated upon its horny contents. This ulceration was the cause of the redness and pain of which the patient complained, and its extent is marked upon the horn, by a rough discoloured surface of a circular figure, surrounded for more than two-thirds of its extent by a margin of thinned integument. The weight of the horn was six drachms.

The section of the growth presents all the characters of horn; it is laminated longitudinally, the laminæ being distinctly traced, by their difference of tint, from the base to the apex of the horn. At the apex, moreover, it is split in the direction of its laminæ, and several external lamellæ are partly separated from those beneath.

In minute structure it is composed of flattened epithelial cells, closely condensed, and in some parts having a fibrous arrangement. The epithelial scales are somewhat larger than those of the epiderma, and possess nuclei; a circumstance which confirms the analogy between the inflected follicles of the skin, and those larger inflections lined by mucous membrane. The flattened cells measured in long diameter from $\frac{1}{700}$ to $\frac{1}{300}$ of an inch; and in short diameter from $\frac{1}{1000}$ to $\frac{1}{350}$; the average of these measurements being $\frac{1}{500}$ for the long, and $\frac{1}{850}$ for the short diameter. The nuclei are for the most part oval in shape, the long diameter measuring $\frac{1}{2500}$, and the short $\frac{1}{3500}$ of an inch.

I made no chemical analysis of the horn in the present case, but this has been done repeatedly on the Continent. M. Dublanc has published an analysis of human horn in the "Journal de Pharmacie,"[1] and another analysis was[2] made of a horn which is deposited in the Dupuytren Museum. Both analyses go to show that horn is chiefly composed of albumen, a small quantity of mucus, phosphate of lime, chloride of sodium, and a trace of lactate of soda.

Since the occurrence of the above case, I have met with several instances of horn in the human subject; one was on the shoulder, two at the root of the nose, and one on the penis. The latter measures in its dried state one inch in length. I have besides in my possession, the contribution of an unknown friend, a fine specimen of horn which grew "on the head of an adult male during a period of nine years." It looks as if it had been broken away from its attachment, and is twisted like a ram's horn. It measures, in its dried state, somewhat more than four inches and a half in length, and two inches and three-quarters in its greatest circumference.

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[1] March, 1830.

[2] Cruveilhier, Anatomie Pathologique, liv. 24, vol. 2; and Journ. de Méd. Prat. de Bordeaux, 1835.

620. The subject of horns in the human person very early attracted the attention of observers, and their occurrence seems to have been more frequent among our forefathers than at the present day. This circumstance may be explained by referring to the improvement which has of late years been made in surgery, and to the more general diffusion of a knowledge of its elementary principles. Upon a recent occasion, namely, the presentation of a paper to the Royal Academy of Medicine of France, by M. Lozes, the committee appointed to inquire into this subject collected seventy-one observations of horny growths from the skin, of which thirty-seven were met with in females, thirty-one in males, and three in infants. Of this number, fifteen were seated on the head, eight on the face, eighteen on the lower extremities, eight on the trunk, and three on the glans penis.[1]

In pursuing this inquiry I have succeeded in collecting ninety cases, of which forty-four were females, and thirty-nine males; of the remainder the sex is not mentioned. Of this number, forty-eight were seated on the head, four on the face, four on the nose, eleven on the thigh, three on the leg and foot, six on the back, five on the glans penis, and nine on the trunk of the body. The greater frequency of this disorder among females than males is admitted by all authors, but this fact is most conspicuously shown in the instance of the thigh and of the head; for example, of the eleven cases of horny growth from the thigh, two only were males; and of the forty-eight affecting the head, twenty-seven occurred in females, and nineteen in males; in the remaining two, the sex being unmentioned. That old age is a predisposing cause of this affection, is proved by the greater frequency of its occurrence in elderly persons; thus, of the forty-eight cases in which the scalp was the seat of the growth, thirty-eight were above the mid-period of life; several were over seventy, and one was ninety-seven;[2] three were young persons,[3] and three were infants.[4]

Cruveilhier, in remarking upon the relative frequency of these growths on different parts of the skin, states that they occur on the posterior and inner part of the thighs, as often as on all the other regions of the body taken together, a circumstance which he attributes to the general use of the chaufferette. But Cruveilhier's statement is not borne out by facts, and numerical data are, as we have seen above, opposed to his opinion. Moreover, he confounds horns with warts and corns, and regards them as the result of cutaneous irritation and enlarged papillæ, with increased secretion of epiderma.[5]

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[1] Mèmoires de l'Academie Royale de Mèdecine, Juin, 1830.

[2] Gastellier. Hist. de la. Soc. Roy. de Méd. vol. i. p. 311, 1776.

[3] Aldrovandus et Bartholinus.

[4] Amatus, Cent. 1, Cur. 1, Zacutus Lusitanus, Prax. Med. Adm., lib. iii. obs. 83. Joseph Lanzoni, Nat. Cur. Ephem. Germ., ann. 4, 1673.

[5] Loc. citat.

621. Several authors have mentioned the development of horny growths from old encysted tumours, and have remarked upon their frequent association with such tumours. Sir Everard Home,[1] was particularly struck by this circumstance; it was present in all the cases which he examined, but he fails in accounting for the horny secretion, which he regards as an imperfect substitute for epiderma. Thomas Bartholin, who collected several cases of human horns, speaks of the origin of one from an encysted tumour,[2] and Soemmering,[3] Gastellier,[4] and Caldani,[5] notice the same fact.

622. Some curious speculations were excited in the minds of the older physicians by the observation of cases of horny growths. Thus, Rhodius[6] met with a Benedictine monk who had a pair of horns, and was addicted to rumination, and Fabricius,[7] having seen a man with a horn growing from his forehead, whose son ruminated, is willing to give the father the credit of transmitting this disposition to the son, by virtue of the ruminant character which he bore so obviously upon his head.

The most remarkable case of human horn on record, is that of a Mexican porter, named Paul Rodriguez.[8] The horn was situated upon the upper and lateral part of the head; it was fourteen inches in circumference around its shaft, and divided above this point into three branches. Voigtel,[9] cites the case of an old woman who had a horn with three branches growing from her forehead; and M. Dubois[10] had a woman under his care, in the Hospice de Perfectionnement, with a horn that measured seven or eight inches in diameter at its base, and was six inches in length. The length of the horn in some recorded instances is also remarkable. Sir Everard Home[11] saw two cases, in both of which the growth measured five inches by one inch in diameter. They were curled, and had the appearance of isinglass. In one case the horn was fourteen years growing. Dr. Gregory[12] mentions a horn which was removed from the temple of a woman in Edinburgh, which measured seven inches. Dr. Chariere,[13] of Barnstaple, saw one growing from the nape of a woman's neck which measured seven inches. A horn in the British Museum is said to measure eleven inches in length, by two-and-a-half in circumference,[14] and Bartholin,[15] Faget, and several other writers, have spoken of horns twelve inches long. A singular instance of horn is mentioned by Cruveilhier, in his "Anatomie Pathologique," as falling under the notice of Dr. Faget, of Bordeaux. The subject was a Mexican Indian, and the horn was situated in the lumbar region on the left side. After growing for three years, it had attained a length of four inches by seven or eight inches in circumference, and was sawn off by the patient's son; after another three years it was submitted to a similar operation, and, at the end of nine or ten years from its first appearance, was extirpated by M. Faget. The portion removed by M. Faget, with the two portions previously cut off, amounted in length to about twelve inches.

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[1] Philosophical Transactions, vol. lxxxi. p. 95, 1791.

[2] Epistolis.

[3] Archives Générales de Méd., vol. xiii., 1827.

[4] Loco citato.

[5] Dict. de Méd.; Art. Cornée.

[6] Bartholinus, de unicorn. aphor.

[7] De ventriculo. Also, Bartholinus, de unicorn. aphor.

[8] New York Medical Repository for 1820.

[9] Handbuch citat.

[10] Dictionnaire de Médecine; Art. Cornée.

[11] Loco citato.

[12] Sir E. Home's paper; loco citato.

[13] Eodem loco.

[14] Eodem loco.

[15] Epistolis.

623. In a scarce tract in small quarto, published in 1676, there is "a brief narrative of a strange and wonderful old woman that had a pair of horns growing upon her head." "This strange and stupendous effect," continues the pamphlet, "began first from a soreness" of the back part of the head where the horns grew. "This soreness continued twenty years, in which time it miserably afflicted this good woman, and ripened gradually into a wen near the bigness of a large hen egg, which continued for the space of five years, more sadly tormenting her than before, after which time it was, by a strange operation of nature, changed into horns, which are in show and substance much like ram's horn, solid and wrinkled, but sadly grieving the old woman, especially upon the change of weather." The horns were shed four times; the first "grew long, but as slender as an oaten straw;" the second was thicker, and on the fall of the latter, two were produced which were broken off by accident. One of these was presented to the King of France, the other is stated to have been nine inches long, and two inches in circumference. The periods of shedding were three, four, and four years and-a-half. There is an engraving of this woman in Dr. Charles Leigh's Natural History of Lancashire, Cheshire, and the Peak of Derbyshire. Her portrait and one of the horns is in the Ashmolean Museum, and another of the horns in the British Museum.

The authors who have given their attention to this curious subject are more numerous than might be expected. Bartholinus and Borellus have each collected numerous cases. Vicq d'Azyr[1] treats of the subject in his essay on "Animal Concretions," in 1780; Franc,[2] in an essay "de Cornutis," in Heidelberg; Sir Everard Home, in the Philosophical Transactions for 1791; Alibert, in his "Précis Théorique et Pratique des Maladies de la Peau;" Rudolphi,[3] in a paper read before the Academy of Sciences of Berlin, in 1815; Dauxais, in a thesis, published in Paris in 1820; Breschet, in the article "Cornée," in the Dictionnaire de Médecine; Cruveilhier, in his "Anatomie Pathologique." The latter author devotes the whole of his twenty-fourth fasciculus to horny growths. And Sir Astley Cooper and Mr. Travers, in their Surgical Essays.[4]

624. The following case is strikingly illustrative of the mode of growth and appearance of a horn when developed on the face. Louise Marino, an Italian peasant, fifty-four years of age, perceived in the month of January, a small tubercle of about the size of a millet-seed imbedded in the integument of the root of her nose. The tubercle was attended with a trifling degree of pain and pruritus, but continued to grow with considerable rapidity. On the 30th of October (same year,) it had acquired the length of an inch, was of a grayish-brown

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[1] Hist. de la Soc. Roy. de Méd., p. 184, 1780-81.

[2] Tract. Philolog. Med. de Cornutis.

[3] Vol. ii.

[4] Part 2.

colour, had the diameter of a writing quill, was grooved along its under surface, and curved like the beak of a bird of prey. It adhered firmly by means of a narrow base to the skin and subjacent areolar tissue. Dr. Portal removed it by incision; the areolar tissue at its base, the periosteum and bone were perfectly sound.[1]

625. A similar case to this, in so far as seat and mode of appearance are concerned, has just come under my care. Finding the horn imperfectly adherent to its base, I displaced it with my nail, and applied caustic to the surface of the sac from which it had originated. This treatment was successful in preventing its return. Another case of horn has lately been recorded by Mr. Dalby,[2] of Ashby de la Zouch, under the incorrect term of "ichthyosis cornea." The horn was six inches in length, and two and-a-half in circumference; it originated in an encysted tumour, and grew from the back part of the scalp of an old lady, seventy years of age. At one time it gave rise to so much pain when touched, that she could not bear to lay her head on her pillow. Mr. Dalby's narration is accompanied by a wood-engraving.

626. *Treatment.*—The examination of the case mentioned in the preceding pages, by shewing the true nature of the growth, suggests the appropriate mode of treatment, and proves, at the same time, that the practice heretofore adopted of removal by incision is altogether unnecessary. It is plain that the indications to be pursued are, 1. To soften and dissolve the horn, that it may be displaced without force from its follicular bed; and, 2. To modify the secreting surface in such wise as to prevent the continuance of the process of abnormal cell-formation. The first of these indications is to be fulfilled by means of alkalies and water-dressing, or by a poultice; the second, by the stick of nitrate of silver. By these means, the growth may be removed; the disposition to its re-formation checked; and a painful operation avoided.

(B.) *Retention of secretion in the sebiferous ducts, the excretory aperture being closed.*

SEBACEOUS MILIARY TUBERCLES.

Syn. *Follicular elevations.* Rayer. *Pearly tubercles.*

627. Little tubercles of a white colour, of about the size of a millet seed, and sometimes of a small pea, caused by the collection of the sebaceous substance within an excretory follicle, the aperture of that follicle being impervious, are very commonly met with on the face and neck of women and children, and persons having a thin and delicate skin. Rayer calls them follicular elevations, but I have thought the term *sebaceous miliary tubercles* more appropriate. A very common seat of these little elevations is the thin skin of the lower eyelids, where they sometimes attain an inconvenient size. I have seen several cases in which the movements of the lid were interfered with by their growth. They are very easily removed by puncture with a fine lancet, and gentle pressure; the operation is by no means painful, for the integument covering them is reduced by distention to a mere

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[1] Il Filiatre, Sebezio, February, 1842.

[2] Lancet, vol. ii., 1850, p. 342.

film. Touching the interior of their sac with a fine point of nitrate of silver effectually prevents their return; or if they be too numerous for this operation, they may frequently be dispersed by a weak solution of bichloride of mercury in almond emulsion.

CALCAREOUS MILIARY CONCRETIONS.

628. In place of sebaceous substance more or less inspissated, it sometimes happens that the secreted matter partakes rather of the calcareous character, being more or less dense and hard, and having carbonate and phosphate of lime in combination. Meckel found a number of these concretions in the skin of the gluteal region, and Voigtel[1] records an instance as occurring on the forehead and root of the nose. Dr. Julius Vogel[2] has described another case of this disease affecting the scrotum. The integument of the scrotum was the seat of severe itching; on the cessation of the itching a number of small conical tubercles were developed, which increased to the magnitude of a pea or hazel-nut. After reaching maturity, the little tubercles wasted and became dry, and were followed from time to time by successive crops. At the period of detailing the case, they were one hundred and fifty in number, seated in or beneath the corium. The contents of these tumours were a white, greasy, and softish substance, like atheroma. Examined chemically, it was found to consist of carbonate and phosphate of lime, with a trace of soda, a small proportion of fat, and some extractive matter.

Mr. Dalrymple has called attention to a similar fact, in relation to a small encysted tumour of the eyelid, and has shown the seat of the calcareous matter to be the epithelial scales of which the tumour was composed. Instead of presenting their natural transparency, the scales "were thickened and hard, and contained granular earthy molecules, which could be removed by immersion in weak muriatic acid." Mr. Gulliver ascertained the earthy matter to be phosphate of lime, with a trace of the carbonate of the same earth.[3] Mr. Dalrymple informs me that he has, since the publication of the preceding, seen a second instance of the same disease.

SEROUS CYSTS.

629. Sometimes, instead of sebaceous or calcareous substance, I have seen the excretory follicles of the sebiparous glands distended with a limpid serous fluid, and attaining the size of small grapes. A gentleman lately consulted me, on whom there were two of these grape-like cysts, connected with the border of the upper eyelid; they were semi-transparent and tense, and interfered very much with vision. I punctured them with a cataract needle, and, after the escape of the fluid, touched the shrivelled cysts with nitrate of silver; the integument soon healed, and they are not likely to re-appear.

ENCYSTED SEBACEOUS TUMOURS.

Syn. *Follicular tumours. Wen. Meliceris. Atheroma. Steatoma.*

630. These tumours, identical in manner of formation with the se-

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[1] Handbuch der Pathologischen Anatomie.

[2] Algemeine Zeitung fur Chirurge innere Heilkunde und ihrer Hülfswissenschaften, July, 1841.

[3] Medico-Chirurgical Transactions, vol. xxvi., 1843, p. 238.

baceous miliary tubercles, but somewhat more deeply seated in the integument, attain to the size of a hazel-nut or walnut, and sometimes to the magnitude of a small orange. They may occur singly, or several may be developed in the same person, particularly when situated on the head. Their common seat is the scalp and face, but they are occasionally seen on other parts of the body. A few years since, I removed one of large size from the integument of the back, and I have also seen them on the abdomen and in the groin.

The sebaceous substance collected in these sacs is variously altered in its qualities or appearance. Sometimes it is limpid and fluid, like serum, and contains crystals of stearine; at other times, it is soft and white, reminding us of pap, or bread sauce—this constitutes the *atheromatous* tumour; again, it is yellowish, and resembles softened bees'-wax—the *meliceroud* tumour; or it may be white and fatty—the *steatomatous* tumour; at other times, it presents various peculiarities of character, more or less referrible to the above heads. The parietes of these cysts are the walls of the excretory duct of the sebiparous gland and related hair-follicle, in a state of hypertrophy, lined in the interior with epiderma. The sebaceous substance which they contain is mingled with epidermal scales and hairs, having a similar origin to those found in the sebaceous accumulation of comedones (§ 596.) When the parietes of the cyst inflame, its contents are often exceedingly fetid. In consequence of the pressure exerted on the scalp by these tumours, the neighbouring hair-follicles are frequently destroyed, and the superjacent skin becomes bald.

The encysted tumours of the eyelids, and some of the polypi of the meatus auditorius, are of the same nature.

631. *Treatment.*—The common practice in the treatment of these tumours is to dissect them out, and this is usually done with great care, under the impression that a particle of the cyst left behind will grow, and develop another tumour. This reasoning is most unphilosophical, and I doubt if empirically it be correct. A portion of the cyst left behind may interfere with the healing of the wound, but a portion of cyst can possess no power of reproducing a dilated and hypertrophied hair-follicle and excretory duct of a sebiparous gland. The removal of these tumours is always a painful operation, and in certain cases, when seated in the scalp, dangerous, from the possibility of the occurrence of erysipelas. I have succeeded always in curing encysted tumours, by laying them open with a lancet or bistoury, pressing out their contents, and injecting the cyst with a solution of nitrate of silver, or touching its internal surface with the solid caustic; and this plan I prefer to the painful process of excision.

V. INFLAMMATION OF THE SEBIPAROUS GLANDS AND IMMEDIATELY ADJACENT TISSUES WITH OR WITHOUT ALTERATION OF SECRETION.

632. The diseases coming under this definition are two in number, Acne and Sycosis, the former being developed in the sebiparous glands of the general surface of the body, and the latter being confined to those which open into the follicles of the larger hairs, espe-

cially of the chin, the upper lip, and the sides of the face. Both are chronic diseases, and of variable duration.

ACNE.

Syn. *Ionthos.* *Varus.* *Couperose*, Fran.—*Hautfinne Kupferfinne im Gesicht*, Germ.

633. Acne (Plate 8,) is a chronic inflammation of the sebiparous glands[1] and of their excretory hair follicles. It is characterized by the eruption of hard, conical, and isolated elevations, of moderate size and of various degrees of redness. The apices of the elevations generally become pustular and burst, while their bases remain for some time in an indolent state before they disappear. On the apices of some of these elevations, the opening of the hair follicle is distinctly apparent, while, in others, the aperture is destroyed by the pustule. In some, the purulent fluid is mingled with softened sebaceous substance, while others subside slowly without suppuration. Some, again, scarcely differ in tint of colour from the adjacent skin, while others are highly congested and surrounded by an inflamed base of vivid redness.

Acne is usually accompanied by other signs of disorder of the sebiparous follicles: thus, in some situations, the glands appear to be excited to undue action, and pour forth an inordinate quantity of secretion, which gives the skin a glossy appearance; in others, their action is torpid, the sebaceous matter is concreted into a solid form, and distends the excretory duct and hair follicle even to the orifice, where, coming in contact with the dust and dirt diffused through the atmosphere, the concreted matter is discoloured, and has the appearance of a brownish or black spot. If a fold of skin, including any one of these black spots be pressed between the fingers, the concreted matter is forced out, and resembles a small white maggot, with a black head. These concretions are popularly known as maggots or grubs. Moreover, in this state of skin a number of small, white, sebaceous miliary tubercles, may also be observed.

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[1] Dr. Gustav Simon regards acne as a disease of the hair-follicle alone, an opinion which he supports by the observation of hairs, and sometimes a perfect hair-follicle, being found in the sebaceous mass squeezed out from their interior. I take a different view of the pathology of the disease, considering disease of the sebiparous gland to be present in the first instance, or concurrently with that in the related hair-follicle. Alteration of the sebaceous substance (§ 596) is the consequence of that disease, (probably inflammation of the vascular membrane of the gland;) impaction of the altered sebaceous matter follows, and in the suite of this impaction, imprisonment of hairs, which in the normal state of the organs would have been thrown off and carried away with the sebaceous secretion. That the hair follicle must be implicated in disorder of the sebiparous glands is obvious, from the structure of these organs; for, with rare exceptions, every sebiparous gland in the body opens by means of its excretory duct into a hair follicle, and the latter performs the office of an efferent canal.

Dr. Simon also suggests, that the steatozoon folliculorum may, in some instances, be the cause of acne, by exciting the sebiparous glands to increased action in the first instance; and the hair-follicle being in consequence over-distended, becomes subsequently the seat of inflammation. This author thinks that the effect of inflammation of the derma immediately surrounding the hair-follicle is the separation and ejectment of the follicle. Here he is undoubtedly in error; the epidermal lining may be and is thrown off by the formation of pus by the surface of the follicle beneath it, but there is no sloughing of the follicle.

The term acne would seem to be derived from ακνη or ακμη, as though it would imply that which is indeed the fact with regard to this disease, namely, that it prevails during the mid period of life, from the age of puberty to the commencement of old age. It may be developed on all parts of the body, but is most frequently met with in those where the integument is thick, as the back, the shoulders, the backs of the arms, and fore-arms, and the breast, or on those parts which are exposed to the influence of the atmosphere, as the face and neck.

684. The varieties of acne, according to Willan, are four in number—namely, acne simplex, acne punctata, acne indurata, and acne rosacea. The first three of these are mere modifications of the same form of disease; indeed the same elevation may, at different periods of its growth, present each of the appearances indicated by these three designations. I shall therefore take the more simple course of describing the affection as appearing under two principal forms—namely,

Acne vulgaris,
,, rosacea.

ACNE VULGARIS.

685. The common variety of acne (PLATE 14, A. G.) commences by small red and inflamed elevations, which gradually become prominent and conoid, and secrete a small quantity of pus at their extremity, while the base remains hard and of a deep red colour, and is surrounded by an inflamed areola of small extent. The suppuration is slow in attaining its completion, usually continuing for six or eight days; at the end of this period the pustule bursts, and the effused fluid desiccates into a thin brownish scab, which leaves at its fall an indolent tubercle, of a purplish livid hue, and frequently a small white and permanent cicatrix. The tubercle remains for a considerable period after the rupture of the pustule, and disappears very slowly. The eruption of acne is generally unaccompanied by pain or heat, and gives rise to little inconvenience beyond that which is caused by its unsightly appearance. When, however, it is developed near a filament of a sensitive nerve, as of the fifth upon the forehead, the pain is sometimes very distressing. The elevations of acne are for the most part successive in their eruption, so that they may be observed at the same moment in all their stages; at other times, and more rarely, a numerous crop may be developed at once.

It frequently happens, that in the centre of each of the conical elevations, and always in some, a small round blackish spot may be perceived. The presence of this spot is the especial characteristic of *acne punctata*[1] (PLATE 14, A. B. C.;) it is the aperture of a hair-follicle, distended with inspissated sebaceous substance (§ 596) up to the level of the skin, and discoloured at the surface by exposure to the dust and dirt contained in the atmosphere. After having suppurated and discharged the sebaceous substance, the elevations diminish in size, they become purplish and livid, and, at a later period, whitish in colour, and disappear by degrees. The punctated form of acne is generally intermingled with that in which the excretory puncta are obliterated.

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[1] Acne punctata is consequently a comedo, with the superaddition of inflammation of the sebiparous follicle.

Occasionally the eruption is remarkable for the indolence of its course; the inflamed elevations are very hard, and deeply rooted in the integument; the suppurative stage is prolonged two or three weeks before reaching its height, and frequently fails altogether, and after suppuration is completed, the purplish or livid tubercles continue for months, sometimes becoming permanent, and at other times leaving indelible cicatrices: this is the *acne indurata.* (PLATE 14, D.) When the indolent form of acne affects any region extensively, as, for instance, the face, the features are disfigured; the entire surface is more or less covered with tubercles of a deep red or livid colour, and variable size, and the integument between the tubercles is thickened and congested. The face and back are the more common seat of this eruption.

ACNE ROSACEA.

Syn. *Bacchia.*

636. Acne rosacea (PLATE 14, H.) is especially characterized by the redness and congestion which attend its conoidal elevations; by the enlargement and frequently varicose state of the veins of the derma; by the tardiness of course of the papular elevations; the slowness of their suppurative stage, and the indolent character of the livid and indurated tubercles which they leave behind. The integument around the elevations is of a deep purple or violet hue, the congestion is increased by a continuance of the causes which gave rise to the disease, and the skin of the affected parts becomes permanently thickened, uneven and tubercular. The more usual seat of acne rosacea at its outbreak is the nose, which is often considerably enlarged by the morbid action; the integument and subcutaneous textures become infiltrated and hypertrophied, and the cutaneous veins tortuous and varicose. From the nose the disease extends to the cheeks, the forehead, the chin, indeed to the entire face, disfiguring the features very seriously. The congestion of acne rosacea is increased towards evening, by taking food, and by the use of every kind of stimulant taken internally.

637. *Diagnosis.*—The diagnostic characters of acne are, the conoidal form of the inflamed elevations, the suppuration of some of these elevations at their apices, the tardy growth and disappearance of others, the livid and indolent tubercle left behind by both, their evident seat in the sebiparous glands, and the disorder of neighbouring glands evinced by the increased secretion of some, the concretion of the secretion of others, and the presence of sebaceous miliary tubercles. The particular characters distinguishing the varieties of acne are, the absence of any appearance of excretory follicle in acne vulgaris; the presence of an excretory aperture in acne punctata; the indolent course of acne indurata, and the general distribution of all these varieties over the surface of the body. Acne rosacea is distinguished from the preceding by the greater vascularity of the ele-

vations, the congestion and thickening of the surrounding skin, and the especial seat of the eruption on the face.

Secondary syphilis sometimes assumes the characters of acne; but the dull-red appearance of the eruption, its large, soft, flat, and glossy tubercles, the ulcerations which succeed the pustules, and the presence of other signs of syphilis, sufficiently mark its nature.

638. *Causes.*—Acne vulgaris is developed at all ages between the period of puberty and the fortieth year, and occurs in both sexes, more frequently, perhaps, in the female than in the male. Acne rosacea is a disease of adult life, and is also more frequent in the female than in the male. The presence of acne indicates a disordered state of cutaneous innervation, and, consequently, of the vascular action of the skin; in some instances it is induced by direct congestion of the integument, as in acne rosacea, while in others it would seem to depend on torpidity of the capillary circulation, and obstruction to the current of blood by sudden and irregular excitation. Torpidity of the capillary circulation is indicated by the altered secretion of the sebiparous glands, which so constantly accompanies the disorder, and, indeed, by the general want of cutaneous activity in persons so affected. The latter cause is present for the most part in the acne of young persons, in that which occurs at puberty, or as a consequence of close application and sedentary employment, or mental fatigue. This kind of disorder of the cutaneous functions is also associated with amenorrhœa.

Congestion, on the other hand, is the active agent in the eruption when arising from general plethora, from the partial plethora which occurs at the critical period of life in females, from exposure of the face to strong heat, from excesses in diet or stimulating drinks, from the use of cold drinks in a heated state of the body, and from the local application of irritating substances. Of the latter it is proper to mention the abuse of certain stimulating washes and powders employed as cosmetics. Partial congestion would seem to be the exciting cause of the eruption, when it is induced by irritation of the gastro-pulmonary mucous membrane.

639. *Prognosis.*—Acne vulgaris is removed with difficulty; the rosaceous variety is also very intractable.

640. *Treatment.*—The treatment of acne must be adapted to the cause of the affection; in those cases in which a torpid action of the cutaneous system is evident, stimulating remedies must be employed, whereas in those which are dependent on congestion, stimulants would be injurious, and would serve to prolong the morbid action. In both cases the regimen should be judiciously regulated; it should be light, cooling, and moderate, and all stimulating diet avoided. To this hygienic management, gentle laxatives, antacids, tonics, &c., may be added, with a view to order the secretions, and regulate the digestive functions. Whenever other general indications present themselves, they must be especially attended to; thus, in young women at the period of puberty, the state of the uterine functions must be ascertained, and at the critical period of life derivative measures may be employed, with every probability of success.

Whenever the indication is obviously congestive, bleeding should be had recourse to, locally, in the milder cases; generally, to a greater or lesser extent, as the state of the constitution may decide, in the more obstinate forms.

In applying the local treatment, due regard should be had to the ordinary principles of surgery; when the pimple is congested and painful, it should be punctured, and the bleeding encouraged by water dressing or poultice; and where pus or sebaceous substance is suspected to exist imbedded in the tubercle, a free puncture, succeeded by a poultice, is especially indicated. When the local determination has somewhat subsided, stimulants may be employed; for this purpose, a lotion containing sulphur sublimatum, two drachms; camphor, one drachm; and distilled water, four ounces, is often of great service; or the hypochloride of sulphur ointment,[1] or an ointment of ioduret of sulphur, in the proportion of ten grains to the ounce of elder-flower ointment or simple cerate. In the simple, as well as in the other varieties of acne, when they present a chronic character, a solution of the bichloride of mercury in emulsion of bitter almonds, or of the same salt in eau de Cologne, in the proportion of a grain to an ounce, will be found of service. A solution of sulphur, in spirit of wine or brandy, has been recommended as a local application, but this merely acts upon the general principle of stimulation, and is inferior in every respect to the solution of the bichloride.

SYCOSIS.

Syn. *Mentagra.*

641. Sycosis (PLATE 14, I.) is a chronic inflammation of the cutaneous textures, very analogous to acne, and apparently differing from that affection only in its site—namely, on the hairy parts of the face, the chin, the upper lip, the submaxillary region, the region of the whiskers, the eyebrows, and sometimes the nape of the neck. The disease is most probably developed in the sebiparous glands, and thence extends to the hair-follicles, and their immediately related tissues, giving rise to conical elevations, which become pustular at their apices, and are each traversed by the shaft of a hair. The pustules of sycosis are of a pale yellowish colour; they burst in the course of a few days, and pour out their contents, which concrete into dark brownish crusts. The crusts fall at the end of one or two weeks, and leave behind them purplish and indolent tubercles, which remain for some time longer, and subside very slowly. The inflammatory action accompanying this eruption often produces thickening of the integument, and frequently extends to the subcutaneous textures. In this way, the roots of the hairs sometimes become affected, and fall out, leaving the skin entirely bald.

[1] ℞
Sulphuris hypochloridi, ʒij.
Potassæ subcarbonatis, gr. x.
Adipis purificati, ℥j.
Olei amygdal. amar. ♏x.
M. bene.

The eruption of sycosis is preceded by a painful sensation of heat, and tension of the skin; this is followed by several small red spots, which rise in the course of a few days into conical elevations, and upon the summits of these, the pale yellow pus, characteristic of this eruption, is formed. At their first appearance, these pustular elevations are few and scattered; in subsequent attacks their number is increased, until at last the whole of the chin and sides of the face may become thickly studded. The eruption is very variable in extent, sometimes affecting one side of the chin alone; at other times, the whiskers and submaxillary region are solely attacked, while in another case, the disease is confined to the upper lip. When the subcutaneous textures are affected, the integument is raised into tubercles and tumours of considerable size, which are more or less covered with pustules and crusts, and have a repulsive appearance. In this state the integument retains its tuberculated, thickened, and congested appearance for the rest of life. When the disease declines, the pustular elevations cease to be developed, the tubercles diminish in size, and the epiderma is thrown off by repeated desquamations.

642. *Sycosis contagiosum.*—M. Gruby, of Vienna, who has recently distinguished himself by his researches into the vegetable nature of favus, and by the announcement of the discovery of vegetable formations in other diseases, has just (September, 1842) addressed a paper to the academy of France, on a new cryptogamic plant, existing in the roots of the hairs of the beard, and around that portion which is contained within the hair-follicle. By the transmission of the seeds of this plant, the disease is rendered contagious, and he proposes for it the name of *mentagrophyte*.

M. Gruby gives the following account of the disease:—It is limited to the hairy part of the face, but is most frequently seen upon the chin, the upper lip, and the cheeks. It covers all these parts with white, grayish, and yellowish scales, which measure from two to six millimetres in breadth, and from three to eight in length. The scales are slightly raised in the middle, their borders are angular, and they are pierced at all points by hairs; they are but loosely connected with the skin, but so closely with the hairs, that in removing a scale we at the same time pull out a hair.

Examination with the microscope discovers to us that the scales are composed of epidermal cells, but the whole of the dermal portion of the hair is surrounded by cryptogamic formations, which constitute a vegetable sheath around it, in such manner, that the hair implanted in this vegetable sheath may be likened to the finger surrounded by a glove.

It is worthy of remark, that these cryptogamia never rise above the surface of the epiderma; they originate in the matrix of the hair, and in the cells of which the follicle is composed, and they ascend so as to surround all that portion of the hair included within the derma. They present every where a prodigious number of sporules, which are adherent, on the one side, to the internal surface of the follicle, and on the other, to the cylinder of the hair; to the former they are very closely connected. Each plant is composed of a stem, of several branches, and of sporules.

This disease of the skin, continues M. Gruby, is an affection of a purely vegetable nature, and is deserving of occupying a place among those disorders, such as favus and aphtha, which consist in the development of parasitic plants, and which might very properly be termed *Nosophyta*.

M. Gustav Simon adds his testimony to that of M. Gruby, in favour of the vegetable pathology of sycosis.[1] For my own part, I have failed to discover these vegetable fungi, and for several reasons, entirely disbelieve in their existence.

643. *Diagnosis.*—The diagnostic characters of sycosis are, the conical form of the pustular elevations, the bright red colour of their bases, their deep-seated relations with the integument, the purplish and indolent tubercles which succeed them, and the site of the eruption. They are distinguished from acne by their situation, and by their relation to the hair.

The pustular diseases, ecthyma and impetigo, have a different character of pustule to that of sycosis; those of the former are large, prominent, and phlyzacious; while the pustules of impetigo are small, little raised above the surface, clustered, and psydracious. The mode of termination of the pustules is equally different: in ecthyma they form large and thick crusts; those of impetigo pour out an abundant secretion, which desiccates into bright yellow crusts; while the crusts of sycosis are hard, thin, and of a deep brown colour. Moreover, ecthyma and impetigo leave behind them no tubercular thickening of the integument.

Syphilitic pustules are distinguished from those of sycosis by the absence of heat and tension, by the flatness of the pustules, by their tardy progress, by their coppery and violet hue, and by their general dissemination over the face. Syphilitic tubercles differ from those of sycosis chiefly by their coppery hue and glossy surface. They are not confined to the hairy parts of the face, and they terminate in ulcerations of greater or lesser depth.

644. *Causes.*—Sycosis is a disease of the male sex, but in rare instances has been seen in the female. It may occur at any period of the year, but commonly makes its attack in the spring or autumn season. The most frequent exciting cause of the disease is the irritation resulting from the use of a blunt razor, in persons predisposed to such affections, on account of the susceptibility of the cutaneous textures. Other sources of predisposition are, exposure to the night air, intemperance, excesses in diet, uncleanly habits, destitution, &c. A very common direct cause is exposure to heat; hence we find sy-

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[1] [Such is not the view of M. Simon in the last edition of his work on diseases of the skin: (*Die Haukrankheiten*, u. s. w. s. 335, Berlin, 1851.) He considers it doubtful, whether the affection in which Gruby observed these vegetable formations was mentagra, inasmuch as Gruby states, that the hairy parts of the face on which he found them were covered with white, gray, and yellowish scales, perforated by hairs; these scales consisting of epidermic cells; and Höfle (*Chemie und Mikroskop, &c.*, 1841, s. 53,) affirms that the disease described by Gruby was pityriasis of the hairy part of the face. Simon states, that he carefully examined a number of hairs of the beard pulled from the face of a man who had suffered for several years under mentagra; but nowhere could he discover the slightest evidence of cryptogamous growth; and so far as he knows, the observations of Gruby have not been confirmed by others.]

cosis to be prevalent among those who work near a large fire, as founders, cooks, &c. M. Foville has observed the disease to be transmitted by contagion, from the use of a razor employed in shaving an affected person.

645. *Prognosis.*—Sycosis is a very troublesome and obstinate affection, lasting for months, and often for years. This may be inferred when it is recollected that shaving is frequently the primary cause of the disorder, and the necessary continuance of the cause cannot but protract the chances of cure. The disease sometimes gets well spontaneously during the summer, to reappear in the colder months of the year.

646. *Treatment.*—The foremost indication in the treatment of sycosis is the removal of the cause; to this end, the razor must be used with more care, or set aside for awhile. The stimulus of excessive heat must be avoided, intemperate habits must be restrained, and a light and cooling diet enjoined. To these rules, which tend to the diminution of the general excitement of the system, may be added the use of laxatives, as of the milder forms of neutral salts, Seidlitz and Rochelle, preceded, according to the judgment of the practitioner, by one or several doses of calomel or blue pill. If the patient be full and plethoric, a general bleeding will be found a necessary preparation for local remedies. In the chronic state of the affection, it may be desirable to subject the patient to the influence of a mercurial course, and if the system exhibit any signs of debility, tonic remedies or steel medicines may be employed. I have found Donovan's solution of great service in this affection, and have also obtained advantage from the use of Fowler's and De Valangin's solutions of arsenic. In the congested state of skin accompanying the eruption, leeches should be applied, or the part well scarified with the point of a lancet, both of these measures being followed by a fomentation of half an hour or an hour's duration, or by a poultice. In the chronic state of the affection, the iodide of sulphur ointment (gr. x. ad. xx. ad. ℥j.) may be tried, with a fair prospect of success, or the nitrate of mercury ointment, of its full strength or diluted. Other remedies that may be beneficially used in this disease are, zinc ointment, the spirituous lotion of bichloride of mercury, a solution of sulphuret of potash, nitrate of silver, &c.

Whenever the hairs are found to be loosened, they should be immediately pulled out, as in this state they are calculated to act as agents of irritation. Mr. Plumbe regards the hairs as the especial cause of the obstinacy of this disease; I do not, however, wholly agree with him in this respect.

CHAPTER XVI.

DISEASES OF THE HAIRS AND HAIR-FOLLICLES.

647. THE hair is liable to a variety of modifications, some resulting from altered nutrition, others from inflammation, either of the formative structure of the hair, or of the hair-follicles. These modifications, alterations, and diseases, I propose to consider, under the six following heads—namely,

Augmented formation of hair,
Diminished formation of hair,
Abnormal direction of hair,
Alteration of colour of hair,
Diseases of the hairs,
Diseases of the hair-follicles.

I. AUGMENTED FORMATION OF HAIR.

648. Augmentation of formation of the hair calls for consideration in a two-fold point of view: firstly, as it relates to simple increase of quantity or length in situations naturally occupied by hair—*abnormal quantity;* and, secondly, to increase of quantity or length in unusual situations—*abnormal situation.*

(A.) *Abnormal Quantity.*

649. Great variety is met with among individuals in relation to quantity of hair; in some persons I have observed the hairs collected into groups of three, and in many situations two have issued from the aperture of the same follicle; while in other persons the hairs are distributed singly at regular distances, and are not clustered.

In the present age, when custom and convenience call for the frequent shortening of the hair, we can form very little notion of differences involved in rapidity of growth. There can be no doubt, that in some persons the growth of hair is more active than in others, but to what extent this difference may be carried is unknown. Judging from female hair, which is permitted to grow to its full length, as well as from hair on other parts of the body, we may rightly infer, that hair left to itself grows to a certain length, and then falls off, to be replaced by a fresh growth. Withof estimates that the hair of the beard grows one line (French) in the course of a week, let us call it one line and a half (English;) this would amount to six inches and a half yearly; and if we suppose, with Withof, that the hair continues to grow at this rate for fifty years, the old man of seventy must have retrenched his beard upwards of twenty-seven feet in length. Berthold states the growth of the hair in persons between the ages of sixteen and twenty-four to be nearly two lines a week, or seven lines a month, and from six to eight inches a year. He found it grow more rapidly after cutting, during the day than at night, and in warm than in cold weather.[1] Men with exceedingly long hair are frequently met with at our country fairs, and Rayer quotes the following instance of remarkable development of this production:—"I once saw a Piedmontese, aged twenty-eight, strongly built, having the chest broad and large, and the muscles of an athlete; the arm was above twenty-one inches, and the calf of the leg nearly two feet in circumference. This man had little beard, and the trunk was very scantily furnished with hair, but his scalp was covered with the most extraordinary crop; frizzled on purpose, it was above four feet ten inches in circumference; the hair was of a dark-brown, approaching to black, extremely fine and silky."

650. It is interesting to remark, that increase in length of the hair is sometimes associated with disease; and in truth we know little of the effects produced upon the system by the habit of removal of the hair. I have known persons who always experience headache after having the hair cut, and many cases are on record in which the removal of the hair is supposed to have given rise to remarkable results. Moreau has published some excellent observations[2] on the advantages and dangers of cutting the hair; and he especially details the case of a young lady cured of mania by that operation. The hair is often found of unusual length in phthisis, and long black eyelashes are considered pathognomonic of strumous disease. This is an interesting observation in relation to phthisis, inasmuch as it serves to illustrate, in another point of view, the vicarious activity which the skin assumes in disordered function of the lungs.

(B.) *Abnormal Situation.*

PILOUS NÆVI.

Syn. *Moles. Mother's marks.*

651. When it is recollected that every part of the skin, with the exception of the palms of the hands and soles of the feet, is organized for the production of hair, it will cease to be matter of surprise that, under certain circumstances, hair should be found to grow to a remarkable length in unusual situations. The proximate cause of this increased growth is augmented nutrition of the hair bulbs, determined by local or constitutional conditions, the local conditions being either special organization of the skin, or external irritation of that organ. In both, the skin presents a deeper tint than usual, from increased formation of pigment in the cells of the rete mucosum, and a greater thickness from hypertrophy of the hair bulbs and follicles.

Local increase of length of hair, depending on special organization of the skin, is usually congenital, and is exemplified in the various forms of *pilous nævi*, or *moles*. In these nævi there is no hypertrophy of the capillary structure of the skin, as in vascular nævi, but simple augmentation of colour, the consequence of increased activity; and augmentation of thickness, the natural result of enlargement of the hair-follicles and bulbs. Pilous nævi appear in various number, and in patches of different size, upon all parts of the body. They are slightly raised above the level of the surrounding skin, and are covered by hair of variable length. In illustration of this subject, Alibert records the case of a young lady, whose skin was studded over nearly every part of the body with moles of a deep-black colour, from which a long, black, thick, and harsh woolly hair was produced. M. Villermé again, in his article on the hair, in the Dictionnaire des Sciences Médicales, observes—"I saw at Poictiers, in 1808, a poor child, between six and eight years of age, that had a great number of mother's marks disposed in brown projecting patches of different dimensions, scattered over various parts of the body, with the exception of the feet and hands. The spots were covered with hair, shorter, and not quite so thick as the bristles of a wild boar, but presenting considerable analogy with them. This hairy covering, with the spots upon which they grew, occupied, perhaps, one-fifth of the surface of the body."

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[1] Müller's Archiv., 1850.

[2] Journal Général de Médecine, vol. iv. p. 380.

652. Sometimes the disposition to the growth of hair is not confined to so limited a spot as a nævus, but exists over a surface of considerable extent. A few years since, I saw a young lad, about twelve years of age, of healthy aspect and constitution, who presented a most unusual growth of long, harsh, and black hair, upon the outer sides of the arms, extending from the backs of his hands to the shoulders. The integument upon which the hair grew was of a brownish colour, and contrasted remarkably with the lighter coloured skin of the rest of his arm, and of the body generally. The contrast was less striking near the circumference of the hairy growth, from the circumstance of the brownish tint terminating imperceptibly in the ordinary colour of the cutaneous surface. The skin, in other respects, was uniform with the rest of the integument; it was neither raised nor tumefied, nor did it differ in temperature from the neighbouring parts. The hairs in this case were about three-quarters of an inch in length, darker in colour than the hair of the head, conical, and differing from the eyelashes in being longer and finer. On examining the skin with a lens, the hair might be seen extending deeply, in an oblique direction, into the integument. On plucking out some of the hairs, and placing them in the field of the microscope, I found them to be provided with a bulb, and to be identical in appearance with the hairs of the head, or of the whisker.

Schenkius and Ambrose Paré record instances in which the body was completely covered with hair; and Daniel Turner relates, quoting from Peter Messias, on the authority of Damascenus, "that upon the confines of Pisa, at a place called the Holy Rock, a girl was born all over hairy, from the mother's unhappy ruminating, and often beholding the picture of St. John the Baptist, hanging by her bedside, drawn in his hairy vesture."

653. Bichat, in his treatise on General Anatomy, remarks that

hairs are occasionally developed on the surface of mucous membranes, as in the bladder, stomach, and intestines; he also discovered them on the surface of renal calculi. In the gall-bladder, he once found about a dozen hairs, evidently implanted by the roots in the tissue of the mucous membrane. M. Villermé states that hairs have been found on the tongue, pharynx, in the rectum, uterus, and vagina, growing from the mucous membrane.

654. *Local* increase of length of hair, depending on external irritation of the skin, is illustrated in the following cases:—In a little girl recovering from an attack of fever, a considerable growth of hair took place on the site of a blister which had been applied to the nape of the neck. The hair in this case increased to the length of half an inch, but evinced no disposition to grow longer; it was nearly as dark in colour as that of the head, was harsh, but smooth, and thickly planted in the skin. Rayer records a parallel case; and Boyer was wont, in his lectures, to speak of a man who suffered from an inflamed tumour in the thigh, which subsequently became covered with numerous long hairs. Rayer mentions another case, occurring in a medical student, who had several hairy patches on the skin, induced, apparently, by frequent bathing in the summer season, and exposure to the scorching rays of the sun.

655. Augmented growth of hair in abnormal situations, arising from *constitutional* conditions, is illustrated in numerous interesting instances which have from time to time been recorded. In some of these, the unusual growth appears to result from general disorder of the system; in others, it is the consequence of a particular modification of the economy. Of the former kind is the case of a young lady, narrated by Ollivier:[1] she was remarkable for the whiteness of her skin, and for a fine head of jet-black hair; while recovering her strength after the effects of a chronic gastro-enteritis, she perceived, one day, that the entire surface of her skin, both on the trunk and extremities, was raised into small pimples, resembling those produced by cold, and commonly called *goose-skin*. At the end of a few days the pimples presented a small black head, and shortly after, they were found surmounted by a short hair, which grew very rapidly; so that at the end of a month, every part of the body, with the exception of her face, the palms of the hands, and soles of the feet, was covered with a short hairy coat. The individual hairs reached the length of an inch, and were very closely planted.

656. Hair is sometimes developed to a considerable length on the upper lip and chin of women at different periods of age. It occurs most frequently in those possessed of a naturally strong growth of hair, and of a dark complexion. In young women, it is frequently associated with disturbed menstrual function. This fact is observed by Hippocrates; but I have seen several instances in which no such disturbance existed, where the vital functions were well performed, and where the subjects were remarkable for robust health. The development of hair upon the upper lip, and upon the chin, is more common in unmarried females of a certain age, in whom, from

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[1] Dictionnaire de Médecine, article Poil.

inaction, the ovaries have become atrophied; it is also observed in sterile married women. In both these cases, other changes, evincing the deprivation of the peculiar characteristics of the sex, are observed, such as dwindling of the mammæ, absorption of the subcutaneous adipose tissue, harshness of voice, masculinity of deportment, of action, &c. A similar condition is remarked in women who have ceased to menstruate, either from natural or pathological causes. John Hunter, alluding to the circumstance of female birds, after having ceased to breed, assuming the plumage and other attributes of the male, says, "We find something similar taking place even in the human species, for that increase of hair observable on the faces of many women in advanced life, is an approach towards the beard, which is one of the most distinguishing secondary properties of man." "The female, at a much later time of life, when the powers of propagation cease, loses many of her peculiar properties, and may be said, except from mere structure of parts, to be of no sex, even receding from the original character of the animal, and approaching in appearance towards the male, or perhaps, more properly, towards the hermaphrodite."

657. *Treatment.*—Where the growth of hair has become a deformity, which the patient is desirous of having removed, several modes of local treatment may be adopted. If its seat be isolated and small, as on a pilous nævus, the best treatment is excision, which, when carefully performed in the direction of the natural furrows of the skin, scarcely leaves any trace of cicatrix. Another mode of getting rid of hair is by means of the ciliary forceps, or tweezers. Their complete eradication will, however, be found difficult; for the formative organ still remains, and the hairs are constantly reproduced. A third mode of removing hair is by *depilatories;* these are powders composed of quick-lime, subcarbonate of soda, or potash and sulphuret of arsenic. They are applied in the form of a paste, and washed off as soon as dry; they act by desiccating and dissolving the hair, and require to be employed with caution on account of their irritating nature. Depilatories are merely temporary removers of the hair; for it is clear that their agency can extend no deeper than the epiderma; the hair pulps consequently remain, and the hair is not long in being reproduced. The following depilatory powder is the safest and best with which I am acquainted:—[1]

℞
Sodæ hydrosulphatis, ʒiij.
Calcis vivi, ʒx.
Amyli, ʒxviij.
M. ft.

The powder, when required for use, should be mixed with water to the consistence of a paste; and after being applied to the skin for one or two minutes, should be removed with a spatula or paper knife.

I have seen deep and troublesome ulcerations produced by the incautious use of depilatories.

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[1] M. Boudet, Journal de Pharmacie, vol. xviii. p. 119.

II. DIMINISHED FORMATION OF HAIR.

ALOPECIA.

Syn. *Defluvium pilorum.*

658. Alopecia, or baldness, results from defective development or atrophy of the formative organ of the hair, and occasionally from disturbed circulation in that structure. Sometimes the baldness is *congenital;* at other times it is *accidental*, appearing after the full growth of the hair, and causing its fall to a greater or less extent; and again, it may be the *natural* consequence of age, *calvities.* Under these three heads, therefore, I propose to consider the phenomena presented by the defective state of formation of the hair, namely,—

Congenital alopecia,
Accidental alopecia,
Natural alopecia.

CONGENITAL ALOPECIA.

659. Congenital baldness is sometimes, but very rarely, observed in newly-born infants, in whom, though well-formed and healthy with regard to every other function, the hair has been retarded in its appearance until the end of the first year, and sometimes so long as the second and third years. I have never seen an instance of congenital absence of the hair of the head, but I have met with cases of deficiency in other regions, as upon the chin and pubes. "Congenital absence and ulterior defective development of the hair," says Rayer, "are phenomena of considerable rarity, which I have, nevertheless, had opportunities of observing. Such was the case of the man Beauvais, who was a patient in the Hospital de la Charité, in 1827. The skin of this man's cranium appeared completely naked; although, on examining it narrowly, it was found to be beset with a quantity of very fine white and silky hair, similar to the down that covers the scalp of infants; here and there upon the temples, there were a few black specks occasioned by the stumps of several hairs which the patient had shaved off. The eyebrows were merely indicated by a few fine, and very short hairs; the free edges of the eyelids were without cilia, but the bulb of each of these was indicated by a small whitish point; the beard was so thin and weak, that Beauvais only clipped it off every three weeks; a few straggling hairs were observed on the breast and pubic region, as in young people on the approach of puberty; there were scarcely any under the axillæ; they were rather more abundant on the inner parts of the legs; the voice had the pitch and intonation of that of a full grown and well-constituted man. Beauvais is not deficient in the virile indications of his sex; he has had syphilis twice. He tells us that his mother and both his sisters had fine heads of hair; whilst his father presented the same defect in the commodity of hair which he does himself."

ACCIDENTAL ALOPECIA.

Syn. *Porrigo decalvans. Alopecia areata; circumscripta. Area. Tyria. Ophiasis.*

660. Accidental baldness is a more common affection than congenital deficiency in the development of hair. I have seen numerous instances, in which the baldness has been nearly complete upon the scalp, one or two small islets of hair-bearing integument alone remaining, while the hair of the eyebrows, whiskers, and beard was totally lost. In one of these cases, I found the scalp smooth and polished, thinner than natural, and somewhat stretched over the cranium, giving the idea of an abnormal increase in the convexity of the bones of the head. There was, however, no such condition present. When examined closely, the scalp was seen to be studded with numerous superficial, minute, dusky points, the almost obliterated hair-follicles. In the course of a few months from this time, with appropriate treatment, the tenseness, thinness, and polish of the scalp became diminished; the follicles could be seen extending to a greater depth into the scalp; and the mouth of each follicle became the seat of a small pimply elevation of the epiderma. This I regard as the commencement of the second and restorative stage of the disease; the entire surface at this period has the appearance of the cutis anserina, and, in the course of a few days, a minute downy hair may be seen extending from the apex of each little projection. This stage of the case is frequently accompanied by an itching sensation, produced by the imprisonment of the hair within its follicle, the aperture being partially closed by the corrugated edge of the epiderma, and, frequently, by a minute operculum formed by the hardened secretion of the follicle. The operculum is rubbed off, in the attempts of the patient to relieve this itching by friction or scratching, and the downy hair, before invisible, becomes apparent. The newly-formed hair is for some time thin, dry, and slender, and lighter in colour than the adjacent hair, but after a time it gains its proper thickness and hue.

Instead of affecting the entire head, the hair sometimes falls off, without any premonitory symptoms, to a limited and circumscribed extent only, leaving one or more roundish patches on the scalp, of which the surface is smooth, white and depressed. On examining the skin at this part, it is evident that the hair-follicles are either very much diminished in size, or in many instances entirely gone, particularly towards the centre of the patch, in which situation the scalp is obviously thinner than in the surrounding part. This, like general accidental alopecia of the scalp, is clearly an atrophy of the hair-follicles of the part affected. To this form of the disease various names have been assigned by different authors. From presenting a regularly circumscribed disk of baldness, surrounded by long and unaffected hair, it has been named "*alopecia circumscripta*," and "*area.*" When several of the patches run into each other, so as to present a serpentine form, it has been called "*ophiasis*," but its more common designation is that which it received from Willan. Observing that, as in trichosis, the hair was lost in the form of roundish patches, Willan assigned to the disease the name of "*porrigo decalvans.*"

CALVITIES.

Syn. *Senile Baldness.*

661. Alopecia, the natural consequence of age, is a change taking place gradually in the follicles, by which the formative structure, from deficiency of nutrition, becomes atrophied, and the follicles themselves obliterated. The change is usually preceded by dryness, and loss of colour of the hair. But baldness of this kind is not necessarily confined to old persons; it is daily observed at an earlier period of life, as at forty, thirty, and sometimes in persons still younger. Occasionally it results from mental anxieties, severe afflictions, &c.; but at other times comes on without apparent exciting cause.

In association with the baldness of age, it is interesting to observe, that alopecia occurs on the vertex of the head, in that situation in which the integument is bound down somewhat tightly upon the bones of the cranium, and where the circulation is least abundant, and most likely to be interfered with. We frequently see it limited on each side by a line which corresponds accurately with the parietal ridges, and posteriorly by the situation of the upper margin of the posterior portion of the occipito-frontalis muscle, while below this line, over the temporal muscle at each side, and over the occipito-frontalis muscle behind, the hair still remains comparatively unaffected. It is obvious that in this case the cause of the fall of hair must be sought for in an impediment to circulation through the texture of the scalp of the upper part of the head; and in correspondence with this interference, we remark the exceeding paleness of the cranial region. But the same cause may be supposed to have existence also in women, unless we admit that a larger quantity of adipose tissue situated beneath the integument of the scalp may afford an easy and unimpeded transit for the minute vessels to the capillary plexus of the derma.

I am the more induced to suppose that this may be the case, from observing the indisposition to baldness on the pubes, where a thick cushion of fat is interposed between the hard parts and the surface, and the vessels are enabled to make their passage through a soft and yielding medium to their distribution in the papillary layer of the skin.

The integument of the scalp of old persons who have been bald for some time, is remarkable for its extreme smoothness. Bichat observes, that he examined the scalp of several bald heads by dissection, and he invariably found that the internal surface of the integument, when raised from the fat and superficial fascia, was remarkably even. There was no trace of the numberless appendages constituting the follicles of the hairs which are found in the hairy scalp. On the contrary, in a man recently bald from typhus fever, the follicles were distinctly apparent, and contained each a minute, colourless, down-like hair, the rudiment of a fresh growth. Hence, he continues, there is this important difference between the baldness of the aged and that which succeeds disease; that in the first, the whole of the secreting structure dies, (that is, becomes atrophied,) from the cessation of circulation in the vessels of the part, whereas, in the latter, the hair alone falls, while the follicle remains behind.

Bichat has also remarked, that the follicles of the hair, when seen from the external surface, appear to become more and more shallow, until they at last reach the surface, and are obliterated completely. The same change may be observed on the surface of tumours forming in the scalp. The integument becomes gradually thinned, the hair-follicles become more and more shallow, until every trace of them has disappeared, and the hairs which they once contained fall off.

662. *Causes.*—The proximate causes of baldness have been already stated; they are, defective development of the formative organ, defective circulation in the formative organ, and defective nutrition of the formative organ. The remote causes are, hereditary peculiarity, the termination of acute diseases, certain diseases of the skin, certain general affections, syphilis, mercury, coffee taken in excess, late hours, extremes in venery, old age. The falling off of the hair, which occurs during convalescence from fevers and diseases attended with extreme depression of the vital powers, must be ascribed to the enfeebled powers of the system, and consequently to defective nutrition of the hair. Lemery[1] mentions the case of a patient who, some months after a violent hypercatharsis, lost the whole of his hair.

The hair may suffer from any disease in which the activity of the nervous and vascular systems is directed especially to any one portion of the body, as in some local diseases. I have seen nearly the whole of the hair of the scalp lost during the progress of an ordinary pregnancy. In rheumatism and gout, the hair is liable to grow dry, and fall off. The loss of hair is sometimes remarkably exhibited in phthisis,[2] in which disease not only the hair of the scalp, but also that of the eyebrows and beard, is apt to fall. This change is particularly observable in young women possessed of extremely long hair. Numerous instances, in which alopecia is attributed to syphilis, are detailed in the works of old authors, and they are far from being rare at the present day. Mercury, also, when taken for a length of time, is supposed to affect the secreting organs of the body injuriously, and among these, the secreting apparatus connected with the skin. M. Lagneau, in his article "Alopecia," in the "Dictionnaire de Médecine," expresses a different opinion, as relates to the operation of mercury. He remarks, that it is erroneous to suppose that persons affected with syphilis are rendered bald by the abuse of mercury, for alopecia has been seen to manifest its presence, occasionally, before the patients have employed this remedy, or any other anti-syphilitic medicine whatsoever. On the other hand, he continues, I do not believe that any one ever saw alopecia developed after the cure of other diseases in which it is customary to exhibit mercury.

Baldness is much modified by sex; in the male it is a common affection, but in the female, on the contrary, it is rare. I am disposed to believe that the difference between the sexes lies in the greater proportion of subcutaneous fat existing in the female. The scalp of bald persons is usually excessively thin, and eunuchs, who are generally fat, are remarkable for the length and permanency of their hair.

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[1] Mem. de l'Acad. des Sciences, prem. mem. vol. ii. p. 39.

[2] Hippocrates remarks, "Quibus tabe laborantibus, capilli de capite defluunt, hi, alvi, fluxu supervenienti, moriuntur."

Gustav Simon ascribes alopecia areata to the destruction of the hair by a vegetable fungus. I am an unbeliever in the doctrine.

668. *Treatment.*—The principal indication to be fulfilled in the treatment of baldness, is to stimulate the capillary circulation of the scalp, which is evidently below the natural standard. With this view I am in the habit of recommending the washing of the head every morning with cold water, drying it by friction with a rough towel, brushing it with a hard hair brush until redness is produced, and then applying some stimulating application, rubbed briskly into the scalp for the space of five minutes. In women whose long hair contra-indicates the use of the cold-bath, stimulating applications with plentiful brushing must be relied on. An excellent stimulating pomatum for the purpose is the "unguentum stimulans," which is prepared as follows:—

℞
Pulveris cantharidum, ℥iij.
Adipis purificati, ℥xiij.

Macerate with a moderate heat for twenty-four hours, and filter through paper.

From two to four drachms of the unguentum stimulans combined with an ounce and a half of sweet-scented pomatum, form an elegant and useful compound for procuring the proper amount of stimulation of the scalp in alopecia.

In addition to the trichogenous pomatum, it is sometimes convenient to be in possession of an agreeable stimulating wash for the hair. The wash may either be used alone or alternately with the pomatum. The best trichogenous wash, according to my experience, is the following, which I have used for several years:—

℞
Olei amygdalarum dulcium;
Liquoris ammoniæ, āā ℥j.
Spiritus rorismarini;
Aquæ mellis, āā ℥iij.
M. ft. lotio capillaria.

Various stimulating substances have been suggested and used from time to time, in the treatment of alopecia, with advantageous results; such as mustard, horse-radish, walnut leaves, the pomades of Dupuytren and Gibert, &c. The pomatum ascribed to Dupuytren, a clumsy compound, is the following:—

℞
Purified beef marrow, ʒviij.
Acetate of lead, ʒj.
Peruvian balsam, ʒiij.
Alcohol, ℥j.
Tincture of cantharides, cloves, and cannella, āā ♏xv.
Mix.

The trichogenous ointment recommended by Gibert, consists of

Purified beef marrow, ʒvj.
Oil of sweet almonds, ʒij.
Powder of red bark, ʒj.
Mix.

Avicenna recommends the use of leeches, slight scarification or acupuncture in the first instance, followed by rubefacients. The latter were in high favour among the ancients, and they have left of them in their writings a goodly list, of which the following are the principal:—oils of camomile, wormwood, bay, laurel, and dill; hellebore, euphorbia, pomegranate, nasturtium, stavesacre, fœnugreek, rosemary, sage, Peruvian balsam, tar, frankincense, mastich, myrrh, and ladanum. Ladanum is warmly praised by Dioscorides and Galen, and occupies a place in most of the local applications for baldness.

It would not, however, in all cases, be judicious to limit the treatment of baldness to external remedies. Where disturbance of the secretive and digestive functions is present, these require attention. Where the energies of the nervous system are obviously reduced below their natural level, steel medicines and tonics may be used with advantage.

When the hair begins to grow after baldness, it is at first of a light colour, dry, soft, and almost downy, like the young hair of a newly-born child; but by degrees, under favouring circumstances, it resumes the colour and strength of the surrounding hair. At other times this colourless hair remains during life, and forms a remarkable contrast with the dark hair of the rest of the head. The restoration of the hair to its primitive strength is said to be favoured by shaving the scalp, the object of this operation being to confine the nutritive fluids to the formative structure, until it shall have regained sufficient power to produce hair of a proper degree of size and strength. Many authors concur in the advantage of shaving as a means of strengthening the hair. Fallopius upon this subject observes, "Il y a quarante ans que nous portons la barbe longue, en signe de notre déshonneur et de notre servitude; avant cette epoque nous nous rasions et nos poils ne tombaient pas. Les Espagnols en envahissent l'Italie, y ont introduit la tyrranie, la verole, et l'usage de la barbe longue."

III. ABNORMAL DIRECTION OF THE HAIR.

664. Under the head of abnormal direction of the hair, I have assembled two instances of irregularity in its growth and arrangement, not referrible to the preceding groups. They are,

Trichiasis,
Felting of the hair.

TRICHIASIS.

665. Trichiasis is an irregularity in the growth and direction of the eyelashes. The cilia in this disorder grow inwards towards the surface of the eyeball, and by rubbing against the conjunctiva, give rise to chronic inflammation of that membrane.

The treatment of trichiasis consists in removing the misdirected lashes by means of the ciliary forceps, and preventing their future growth by the application of nitrate of silver.

FELTING OF THE HAIR.

666. Felting is a derangement of the hair arising from neglect, and has no claim to consideration as a disease. It consists merely

in a state of inextricable interlacing of the hair, best expressed in its name. Felting of the hair is rarely met with, and when it exists, is seen in women whose long hair affords the only excuse for such a state of disorder. It has been observed after child-bed, and in cases of extreme distress.

IV. ALTERATION OF COLOUR OF THE HAIR.

667. Alteration of colour of the hair arises from disorder of the chromatogenous function of the formative organ, and is very commonly associated with alteration in tint of the rete mucosum of the skin. It is by no means a rare occurrence to find a lock of hair different in colour from that which surrounds it. Less frequently, sudden alterations of colour have been observed, while blanching of the hair, or canities, is the natural effect of the torpor of function which accompanies age.

668. Two instances of reproduction of hair of different colour to the original, after recovery from severe illness, are recorded by Alibert; in one of these, a head of bright red hair replaced one of dark brown, and in the other, hair of a deep black colour took the place of brown. In the case of baldness from hypercatharsis, mentioned in a preceding section (§ 662,) the hair, originally of a brown colour, was reproduced blonde, and gray hair has been known to fall off in advanced age, and a new crop, similar in colour to that possessed in youth, to be substituted.

Dr. Isoard, in a paper entitled, "Observation relative à une famille dont chaque individu presente plusieurs anomalies remarquables," in the "Journal Complementaire du Dictionnaire des Sciences Médicales," amongst other extraordinary physiological and pathological anomalies observed in the members of this family, remarks, that one of the daughters, seventeen years of age, and deaf and dumb from birth, each time that she is attacked by a fever peculiar to her constitution, undergoes a change in the colour of her hair, from a pleasing blonde to a dusky red, but that so soon as the febrile symptoms diminish, the natural colour is restored. In the second volume of the "Memoirs of the French Academy of Sciences," is the narrative of a case in which the hair of a female was changed from brown to blonde during her confinement, which otherwise presented no remarkable feature. M. Villermé[1] relates the case of a young lady, thirteen years of age, who, having never suffered from any more serious illness than slight pains in the head, perceived, during the winter of 1817-18, her hair to fall off in several situations, until, at the end of six months, there was not a single hair remaining. In January, 1819, the scalp began to display a new growth, of a black-coloured wool, in the situations first affected, and of brown hair over the rest of the head. The wool and the brown hair became white, and partly fell off after they had reached the length of three or four inches, while the rest changed their tint at a certain distance from the point, and became chestnut-coloured for the rest of their extent towards the root.

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[1] Journal Générale de Médecine, vol. lxix. p. 213.

The hair had a singular appearance, half white and half chestnut. The specimens sent to the society were mingled with a number of short hairs entirely chestnut-coloured. In remarking on the preceding case, M. Villermé observes, that he has more than once seen the hair, particularly in phthisical patients, after having become white, and fallen off, succeeded by a crop of new hair of a darker colour even than the original hair of the patient. The late Dr. Chaumenton presented this phenomenon in a marked degree.

Dr. Bruley, a physician of Fontainebleau, communicated to the Society of Medicine in Paris, in the year 1798, the history of a woman, sixty-six years of age, named Castellane, whose hair, naturally white and transparent as glass, became jet-black four days before her death. She died of phthisis. Some of this hair was transmitted to the society, and was found to be quite black, with a few white hairs interspersed. On examination after death, Dr. Bruley found the bulbs of the black hair of an immense size, and gorged with dark pigment. The roots of the white hairs which remained were dried up, and two-thirds smaller in size than those of the black hair. In remarking upon this case, Dr. Bruley observes, "It is certain that disease may give rise to a change in a short period, that, according to Haller, requires a long period to accomplish naturally."

CANITIES.

Syn. *Trichosis poliosis*. Good. *Blanching of the hair.*

669. Under the term canities, I propose to describe whiteness of the hair, whether its production be congenital, or dependent upon age, disease or other causes. Dr. Copland regards the term as applicable only to whiteness resulting from an abnormal cause; hence he defines it, "hairs prematurely gray, hoary, or white." Canities presents two varieties in *degree;* in the one the hair is "snowy," of an opaque white, and corresponds in thickness with ordinary hair; in the other, it is clear and transparent, the "silvery hair" of age assuming a yellowish tint on desiccation by the atmosphere, and not unfrequently thinner than ordinary hair. These two offer remarkable chemical differences; the former containing an abundance of calcareous salts, and the latter a much smaller quantity, or even none.

670. Canities may be of three kinds; congenital, accidental, or senile; it may also be, in either of the three groups, partial or general.

671. Congenital whiteness of the hair is usually partial; I have seen two examples in young children where the phenomenon presented itself in the form of round patches; both were of the snow-white kind; in the one the patch was situated on the side of the head, while in the other it occupied one side of the forehead. The skin upon which the hair grew was remarkable for its whiteness, and contrasted strongly with the neighbouring integument. Bartholin saw an infant, the whole of whose hair on one side of the head was brilliantly white, while the opposite side was as equally remarkable for its jetty blackness. Ridlinus and others have seen the entire head of young persons uniformly white, although different in appearance from that of old age, and approaching very slightly towards the blonde. I have

before alluded to the whiteness of the hair of Albinos, both of the European and of the African race. Rayer, in the atlas accompanying his work upon diseases of the skin, gives a delineation, copied from a picture in the Museum of the Jardin du Roi, of a young negro, upon the middle of whose forehead, and rising from the root of the nose so as to include a moderately large patch of hair on the front of the head, is a broad tract of skin wholly deprived of pigment: the hair is perfectly white, and the white band on the forehead is rendered the more striking, by presenting a roundish islet of deep black near its middle. On the same plate is a figure, representing the head of an Albino negress, copied from Buffon; the skin of the face and the wool upon the head are entirely and completely white. Schenkius details the case of a young man, whose beard grew white on its first appearance.

672. Accidental and senile canities present varieties in *extent:* sometimes the whiteness is partial, being intermingled with the ordinary hair over the entire head, and producing, according to its proportion, the relative shades of gray. At other times it is local, and confined to one or several spots, constituting so many distinct patches; or it may be general, and involve the entire head of hair. It commences generally upon the temples, and thence spreads gradually over the rest of the head. Blanching of the hair occurs first upon the head; it proceeds in the next place to the hair of the face, and subsequently attacks the pilous covering of other parts of the body. When white hair falls off it is not reproduced, but the scalp beneath remains bald. In Europe, canities would appear to be equally common in the male and in the female; but attacks the latter at a later period of life, unless induced by other causes than age. "In China," says Mr. Ray, "the women turn gray sooner than the men; the former are often bald, the latter seldom."

Blanching of the hair commences at the root, and the coloured part is gradually carried onwards, further and further from the integument. It is curious to see the hair undergoing this change, party-coloured in appearance, and reminding us of the ringed hair of the gray cat and ichneumon. The kinds of hair most liable to the invasion of whiteness are those of a dark colour, as black and brown: blonde and auburn hair rarely become gray, but are more liable to fall off.

673. *Causes.*—Congenital canities depends upon some constitutional peculiarity inherent in the organization of the individual. Senile canities is the consequence of diminished powers of the nervous system, as evinced either by the alteration of the pigment deposited in the formative cells of the hair, or by the entire absence of the colouring principle.

The remote causes which have been observed to give rise to accidental canities are, mental emotion, physical suffering and privation, constitutional affections, disease, and injuries. Of mental emotion, as of grief, anxiety, fear, terror, anger, acting as exciting causes of blanching of the hair, there are numerous recorded instances. In some of these cases the effects were gradual, in others they were immediate, producing the silvery tints of age, it is asserted, in the course of a few hours.

"The different passions of the mind," says Bichat, "have a remarkable influence over the internal structure of the hair; often, in a short period, grief effects changes in its colour, blanching the hair probably by means of absorption of the fluids contained in its tissue. Many authors have recorded similar facts. Some, and Haller among the rest, have doubted the truth of these assertions, but I know at least five or six examples, in which the loss of colour was completed in less than eight days. In a single night, a person of my acquaintance became almost entirely blanched, on receiving some distressing news."

The hair of Marie Antoinette, the wife of Louis XVI., is said to have become gray in a short period, from grief. The same statement is recorded with regard to Mary Queen of Scots. It is affirmed that Sir Thomas More became gray during the night preceding his execution. Borellus asserts that two gentlemen, the one a native of Languedoc, the other a Spaniard, were so violently affected, the first by the announcement of his condemnation to death, the latter by the bare thought of having incurred a serious punishment, that both became blanched in the course of a single night. Borellus adds, with regard to the latter gentleman, that his hair regained its natural colour on being set at liberty. Schenkius and Boyle relate similar instances, but without the subsequent restoration. Hermeman also records an instance of sudden loss of colour of the hair.

Dr. Cassan, in a paper in the "Archives Générales de Médecine," before referred to, records the example of a woman, thirty-three years of age, who, on being summoned before the Chamber of Peers to give evidence upon the trial of Louvel, underwent so powerful a revulsion, that in the course of one night the hair was completely blanched, and a furfuraceous eruption appeared all over her head, on her chest, and on her back. After the disappearance of the eruption, the hair still maintained its abnormal colour.

Henry III. of Navarre, on hearing that the edict of Nemours was conceded, a condition favourable to the supporters of the league, was so exceedingly grieved, that in the course of a few hours a part of one of his mustachios whitened. In a person referred to by Rayer, several of the cilia became blanched, accompanied by white spots over the arms and fore-arms, in consequence of mental agitation.

M. Moreau[1] observes—"I once knew an aged man, for whom snow-white hair, and a countenance deeply marked by the furrows of care, inspired the respect which we owe to age and misfortune." "My hair," said he, "was as thou seest it now long before the latter season of my life. More energetic in their effects than assiduous toil and lingering years, grief and despair at the loss of a wife most tenderly loved, whitened my locks in a single night. I was not thirty years of age. Judge, then, the force of my sufferings; I still bear them in frightful remembrance."

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[1] Journal Génèrale de Médecine, vol. iv. p. 280.

The poets make frequent reference to this remarkable and sudden effect of violent mental emotion. Thus a Latin author exclaims—

"O nox! quàm longa es, quæ facis una senem!"

Byron, also, in the "Prisoner of Chillon," refers to the same phenomenon:—

"My hair is gray, but not with years,
Nor grew it white
In a single night,
As men's have grown from sudden fears."

After some diseases of the scalp, it sometimes happens that the newly-formed hair remains permanently white; the same change is occasionally observed upon cicatrices left by wounds.

V. DISEASES OF THE HAIRS.

674. Two diseases only come strictly under this denomination, as being characterized by a morbid alteration in the structure of the hair. One is amongst the most common of the diseases of the scalp of this country, namely, ring-worm; the other is a disease of central Europe, and particularly of the marshy districts of Poland, the plica polonica. Much confusion has existed with regard to the former of these affections, in consequence of the variety of names which have been assigned to it, and also from the fact of the generic title comprehending diseases of a totally different character. Moreover, the names themselves are ill chosen, the term "tinea" relating to the condition of the hair at a period when the disease has been in existence for some time; while the term "porrigo" was selected by Willan only because it had been in use among the ancient classic writers; neither of the terms having any reference to the nature of the disease. Under these circumstances, I consider that a first step to the proper understanding of this affection, and the removal of existing difficulties, might be made by adopting for its designation the term *trichonosis*.[1] I am further induced to give a preference to this term by finding it to coincide with what I believe to be the true pathological nature of the disease, namely, a morbid action producing the degeneration and destruction of the hairs.

675. The proper diseases of the hair are, therefore,—

Trichonosis furfuracea,
Trichonosis plica.

TRICHONOSIS FURFURACEA.

Syn. *Common, or scurfy ringworm. Tinea capitis. Tinea nummularis. Porrigo furfurans. Porrigo scutulata.* Willan. *Porrigo circinnata.* Good. *Porrigo tonsoria. Pityriasis decalvans.* Gibert. *Squarra tondens. Tinea tondens.* Mahon. *Herpes tonsurans.* Cazenave. *Alopecia porriginosa.* Sauvages. *Phytoalopecia.* Gruby. *Trichophyton tonsurans. Trichomyces tonsurans.* Malmsten.

676. Common ringworm of the scalp is characterized by a dry and furfuraceous state of the skin, occurring in circular or oval patches

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[1] Der. θριξ, capillus; *νοσος*, morbus.

of variable size. The patches are slightly elevated, papillated,[1] and spangled, or, as it were, dusted over with minute epidermal scales. The hairs growing on the patches are whitish, twisted or bent, shrivelled and brittle, in some instances broken off near the skin, in others, matted into conical prostrate bundles; or, when augmented in thickness by an accumulation of scurf, condensed into thin yellowish-gray and fissured crusts. When heads affected with this disease are kept clean, the patches look parched, and the hair covering them withered and dried up. At a later period, the patches are left more or less bald, but never completely so as in Alopecia areata.

In the early attack of Common Ringworm, the only appearance of disorder that can be detected is the formation of a thin layer of scurf, either in separate scales around single hairs, or in patches, including several, or a more considerable number. This formation is accompanied by a slight degree of itching, which is relieved as soon as the scurf is torn away by the nails or removed by the aid of the comb. At a later period, the skin upon which the furfuraceous scales are dusted appears reddish and slightly raised; the papillæ next make their appearance on the reddened patches, and subsequently the peculiar alteration of the hair.

When the disease is recent, the papillæ are very conspicuous; they are small and pyramidal, and resemble very closely the papillæ of cutis anserina thickly grouped together: they are, in fact, the mouths of the hair-follicles swollen and prominent from congestion, and have the appearance of being drawn up by the growth of the hair. The papillæ are inclined obliquely in the direction of the hair, are somewhat imbricated, and from the summit of each there issue one or two hairs surrounded by a whitish film, formed by the accreted sebaceous contents of the follicle. In older patches, the papillæ are less evident.

The hairs in this disease have been compared, not unaptly, to "tow." They are remarkable for their bent and twisted shape, and resemble the fibres of hemp in colour as well as in apparent texture; they are irregular in thickness, and are broken off at variable distances from the scalp, giving rise to the moth-eaten appearance from which Common Ringworm derives its synonym, *tinea*. In dark-haired children, the stumps of the broken hairs frequently present little black knobs at the mouths of the follicles.

The crusts which form over the morbid patches when the disease is neglected, are composed of furfuraceous scales and diseased hairs, agglutinated together by the moisture which rises from the skin; they are grayish and yellowish in colour, and when of large size are apt to break up, in consequence of the movements of the integument, into several angular compartments, the line of rupture being remarkable for its white and silvery appearance. Moreover, on the surface of the crust, which is dry and harsh, the tow-like fibres of the diseased hairs may generally be perceived.

The porrigo furfurans of Willan and Bateman is a medley of diseases mingled together in a single description; one while the symptoms seem referrible to eczema, another while they diverge into pityriasis or psoriasis, and only belong to ringworm when the state of the hair is spoken of as partially fallen off, thin, and less strong in its texture, and sometimes lighter in its colour than natural. The remark that the disease "occurs principally in adults, especially in females," carries the mind to those disorders of the sebiparous glands and hair-follicles in which the desiccated sebaceous substance collects about the roots of the hairs, and the latter fall off. We must therefore dismiss porrigo furfurans altogether from consideration.

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[1] The MM. Mahon have compared this appearance to the skin of a plucked fowl; the papillæ they term *asperities*.

The description given by Willan and Bateman of porrigo scutulata, saving the pustules, which are a complication presently to be referred to, evidently applies to common ringworm. The character which principally occupied the attention of these authors in portraying the disease, was the "distinct and even distant patches of an irregularly circular figure," and this character formed the basis of their specific designation. Indeed, the term "scutulata" in reference to them is not inapplicable, for the rounded and well-defined patches, studded over with prominent papillæ, are by no means unlike the *scuta* with which they are compared.

In the early part of its course, common ringworm is wholly unattended with discharge of any kind, and sometimes this absence of secretion is conspicuous throughout its entire existence. At other times, however, and especially when neglected, the crusts give rise to considerable itching, and the attempts made to relieve this annoyance aggravate the inflammation of the skin, and occasion discharges of ichor and pus. Occasionally, as a complication of disease dependent on increased inflammation, pus forms around the apertures of the follicles, and a crop of small pustules is the result. Willan mistook these pustules for the primary form of the disease, and for that reason placed it in his group of "pustulæ." The pustules, when they exist, are generally observed in the most active part of the patches, namely, along their edge, and in this situation I have sometimes seen them forming a double or a triple row.

Common ringworm is attended by considerable itching of the skin, and the irritation and inflammation excited by scratching are apt to give rise to enlargement of the occipital and cervical lymphatic glands. These symptoms subside when the cutaneous inflammation is relieved.

In England, the ringworm here described is one of the most frequent of the diseases affecting the scalp. In France, according to Rayer, the disorder is "extremely rare; I have only," he remarks, "seen a single case of it in a child."

677. *Ringworm of the Body.*—Common ringworm, when it attacks the head, is frequently seen also on the neck, the arms, and other parts of the body. The patches of the disease in these situations are circular in shape; they have a reddish ground, dusted over with extremely fine, white, furfuraceous scales; are slightly elevated and papulated at the margin, but uniform with the surrounding skin in the centre. Sometimes the elevation of the margin is absent; and then, if the powdery scales are collected on the surface in great num-

bers, the patches look whiter than the adjoining skin. In children having a brown hue of the skin, the white appearance of the patches is not uncommon.

The differences which common ringworm presents when viewed on the head and body at the same time, are easily explained, when we remember the dissimilarity of organization of the two regions; the highly developed condition of the hair-follicles and hair of the one, and the smaller dimensions of those structures in the other. The ringworm of the body seems to have but little hold upon the skin, in comparison with that of the scalp, and runs along it with great rapidity. The patches spread by their margin, while their area returns to its healthy state; and the rings (tinea annularis) resulting from this mode of increase, are frequently of considerable dimensions. Sometimes the prominent margin of one ring remains, while the disease propagated from its periphery throws up a second, or even a third ring.

I have occasionally observed this form of ringworm on the neck or arms of adult females who have tended children suffering from trichonosis furfuracea; but as frequently on others who have had no such association.

678. *Pathology.*—The seat of disease in common ringworm is the hair and the epidermal lining of the hair-follicles.

When examined with the microscope, the dry, discoloured, and friable hairs of this disease are found to be more than twice their natural size, and a great change is perceptible in their structure. The average diameter of human hair, as ascertained by a measurement of two thousand hairs from the heads of different persons, is $\frac{1}{400}$ of an inch; while a number of hairs growing from the morbid patches of common ringworm measured between $\frac{1}{240}$ and $\frac{1}{150}$ of an inch.

A healthy hair is composed of three portions—a cortical portion, which forms the surface; a fibrous portion, which constitutes the chief bulk of the hair; and a central medullary portion or pith. Now, in the diseased hair, the cortical portion is little altered from its normal condition, but it is apt, in consequence of the morbid state of the layer immediately beneath, to crack and peel off, and so produce a roughness of the shaft. The medullary portion is apparently unaffected; the chief pathological changes being found in the fibrous portion, and particularly in its external part.

The fibrous portion of the diseased hair appears, from the great difference of structure which it presents, to be composed of two layers—an outer layer of various thickness, made up of colourless nucleated granules, and occupying about one-third the diameter of the shaft; and an inner layer, which retains more or less of the normal fibrous structure.

The external layer of the fibrous portion of the diseased hair is entirely formed of transparent, globular, nucleated granules, closely packed together, and constituting a tesselated structure. The size of the granules is about $\frac{1}{5000}$ of an inch, and they are somewhat flattened from mutual pressure. The cohesion subsisting between the granules is slight, for when the cortical layer of the hair is torn and peeled off, some of the granules remain attached to it, and others are dislocated from their natural position.

The internal layer of the fibrous portion, at the same time that it retains its fibrous character, is evidently altered in its texture; the fibres are thicker than natural, they are undulated in arrangement, and they appear to have entering into their construction, from point to point, one or two, and even long rows of the nucleated granules. The undulated and swollen character of the fibres gives to the entire shaft an appearance of laxity and rottenness of texture, upon which the friability of the hair obviously depends. When a hair is broken across, the fibres give way at unequal lengths, and the ruptured ends look uneven and ragged.

The epidermal lining of the hair-follicles has the same granulated structure as the external layer of the fibrous portion of the hair.

In its essential nature, the morbid alteration above described is a modification of the normal structure of the hair and epidermal lining of the hair-follicles. In a preceding page (69,) I have shown that the hair-fibres which enter into the construction of the great bulk of the hair are composed of cells, and that these latter are made up of granules. Now, if from any cause the granules of the hair-cells should undergo enlargement or hypertrophy, the state of the hairs will be precisely that of common ringworm; and if the destruction of the natural tissue of the hair be considered, it may be described as a *granular degeneration* of the hair.

The mode in which these nucleated granules are formed appears to be identical with that of the production of the analogous granules of Favus. On the dermal surface of the epidermal lining of the diseased follicles I discovered corpuscles perfectly resembling favus-corpuscles, and I make no doubt that these corpuscles undergo the same changes of growth and development. There is, however, this difference between the two affections—namely, that in common ringworm the cell-development ceases with the production of nucleated granules; whereas in Favus, it is driven on another stage—namely, to the formation of cellated and plant-like stems. It is surprising, under these circumstances, that favus is so rare in comparison with ringworm, and that the latter does not occasionally assume the characters of the former.

Gruby, who has made the granules of common ringworm the subject of examination, as well as the abnormal cell-tissues of favus, regards them in the light of vegetable formations, and places them in the same category of parasitic mucedinous plants, under the name of microsporum Audouini. The granules are, of course, sporules; but where the parent plant is that produces them, I am unable to tell. Dr. Malmsten,[1] of Stockholm, seems to adopt[2] the views of Gruby; he gives the disease a new name (trichophyton tonsurans,) and illustrates his paper with an engraving of the appearance of one of the morbid hairs when seen with the microscope.

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[1] Trichophyton Tonsurans, Harskarande mogel. Stockholm, 1845.

[2] I am obliged to speak hesitatingly on this point, for although I have Dr. Malmsten's paper before me, I am not sufficiently master of the Swedish language to make out his opinion.

For myself, I am as little inclined to yield the point in this disease as in favus; on the contrary, the absence of the cellated shafts is an additional ground of argument against the vegetable theory. It is perfectly consistent with the pathology of abnormal nutrition, that the hair-granules should become enlarged, and thus be the cause of the subsequent changes taking place in the hair. But the hypothesis of vegetable growth within the substance of the hair, I find difficult to comprehend.

679. *Cause.*—Common ringworm is a disease of deranged nutrition, its cause being debility of the organization, originating, probably, in defective innervation. In popular language, the disease may be said to depend on "poorness of blood;" and this expression conveys much in reference to the system of living which should be adopted for its cure. It must not, however, be supposed that "living" applies only to food; the other hygienic conditions of air, exercise, ablution, and clothing, are equally necessary to constitute a healthful regimen.

As an illustration of the influence of hygienic conditions in the production of ringworm, I may quote some remarks by Dr. Wilkinson,[1] which were intended for a very different purpose. "Two families of fine children were brought to me from the country and put under my care, who had been for nearly two years affected with porrigo; these cases yielded, like others, to the remedies employed, and in the course of two months seemed entirely subdued. One family remained in London three weeks after the disappearance of all complaint, yet soon after their return to the country, it re-appeared, and became in a short time as bad as ever."

The affection is met with only in children, or, if it occur at all in adults, it is extremely rare. Unlike favus, it is not restricted to the lower classes, but is found in every grade of society, and is often more obstinate in the children of the noble and the wealthy than in those of the poor. I have been struck by its frequent occurrence in children who have been born in India, and brought to this country for their education; and it has appeared to me that this circumstance admitted of explanation, by supposing that their systems had been relaxed and weakened by a hot climate, and that they were consequently unable to resist the morbid effects of the cold of England.

Another predisposing cause of this disease is improper food, and this is a cause which is most active in public schools and large establishments of children. I have sometimes had occasion to regard the prolonged use of an exclusively vegetable diet as the cause of the affection, and am convinced that a milk diet, continued for a long time without change, will give rise to the disease.

The restraints of mobility and amusements, to which children are subjected in schools, is another and a frequent cause of ringworm. Confined in ill-ventilated rooms, congregated in considerable numbers, bending their little minds to distasteful labour, commencing their studies the instant they have swallowed their meals, and kept to their books for several successive hours in the day, it cannot be a matter of surprise that the nutritive functions of the body should suffer, and that derangement of one of the simpler actions of the economy should be the consequence. Under such circumstances, the disease will probably be endemic, and the greater part of the children of a large school might be consentaneously or successively attacked.

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[1] Remarks on Cutaneous Diseases. By J. H. Wilkinson, 1822.

680. *Is ringworm contagious?* I believe that it is not. Nothing that I have hitherto seen, and I have watched the disease with care, has satisfied my mind with regard to its imputed communicability. The observation of a great number of children in the St. Pancras workhouse, as well as in private practice, leads me to an opposite conclusion, and this conclusion seems confirmed by the pathology of the disease.

Those who consider ringworm to be contagious, look upon it as a local affection, engendering a kind of poison, which is conveyed to another by means of combs, brushes, caps, or towels. The advocates of the vegetable theory do not hesitate to assert, that the nucleated granules are the seeds of the disease. Such a supposition appears to me to be highly unphilosophical, and indeed, unwarranted by a more correct comprehension of the nature of these bodies.

If there be a poison, it must be more subtle in its nature than these nucleated granules, and capable, like other contagious principles, of poisoning the entire circulation of the patient, for the disease undoubtedly lies in the constitution, and is to be eradicated more by constitutional than by local means. In fact, ringworm is not a local disease, but one which pervades the entire economy, the local disorder being simply the effect of the constitutional disturbance, such as a multitude of causes capable of deranging health might occasion.

It is stated that ringworm has not been known as a disease affecting the middle and higher ranks of society more than fifty years, although it has existed for centuries among the poor. If this be true, it is a fair argument against its contagiousness, unless, indeed, it can be shown that the laws of life and organization are different in the plebeian and in the patrician; that the rich and ruddy stream of the latter repels a poison engendered in the troubled puddle of the former. But that such is not the case is proved by the fact that the noble and the wealthy are now as liable to the disease as are the poor. Dr. Wilkinson, in suggesting a probable reason for the outbreak of the disorder among the better classes, observes:—"Of all the various conjectures formed upon this subject, perhaps the most plausible is, that the number of children sent from the East and West Indies for their education has been, during the 'period referred to,' very much increased, many of whom bringing the disease with them, introduced it to the schools, and spread it rapidly through the island." Few of my readers will, I think, be inclined to admit this explanation as correct, but it corroborates the observation which I have myself made of the liability of European children, born in a warm climate, to this disease, when transferred to England.

The same author, in another page of his work, observes:—"As some of the profession doubt whether the porrigo can be produced in any other way than by contact, I have paid particular attention to this point, and I am convinced that some children are capable of generating the disease."

"Four children were brought to me who had never been out of their parents' house but in their carriage, never had any other children to visit them, and never visited any; in short, the mother informed me that they were so strictly particular on this point, that they never suffered the servants who attended upon the children to have any communication with others. One of these children generated the porrigo furfurans; and between two and three weeks after communicated the scutulata to two of the others, and the decalvans to the fourth."

Can any thing be more clear than that the predisposing cause of the disease in the above instance was the artificial physical education and mischievous restrictions to which the poor children were subjected? Dr. Wilkinson admits that the disease was generated in one of the children, but it may be asked—If so, why not in all? Why should a disease *generated* in one be *transmitted* in the rest? The answer is obvious—Because Dr. Wilkinson was prejudiced in favour of the theory of contagion. The reader may be reminded, also, in reference to this case, that porrigo furfurans and porrigo scutulata are the same disease, and that porrigo decalvans originates in the same causes which give rise to ringworm.

Dr. Wilkinson further observes:—"I have had several other cases where I had as much reason to believe that the children generated it; one was a child of only three months old, who had never been, since her birth, in more than one room." Thus it will be seen, that the too great care of parents in regard of their offspring is frequently attended with the same results as extreme neglect. An important rule of conduct so far as the management of children is concerned, may be deduced from this observation.

In reference to a case already mentioned, in which the disease was cured in London, and remained so for three weeks, but reappeared as soon as the patient returned to the country, Dr. Wilkinson remarks:—

"During the last three weeks spent in town, as nothing was used to prevent the disease from reappearing, and as it is a *contagious and active fluid*, How is its action suspended for such a length of time? and Where does it lurk? since its whole action in two or three of the varieties seems confined to the cutis and the cuticle. I can account for this in no other way than by concluding that the patient generates the disease, for in such way of course, however completely it may be banished from the surface, it may be regenerated, unless the habit of body or the secretions be entirely altered."

Another author, Dr. Walter Dick, in an excellent treatise on the "different forms of porrigo," observes, "We have seen ringworm attacking two or three subjects in the same family, almost at the same time, when the occurrence of the disease could not be traced to contagion. We have been led to believe that the disease, under these circumstances, originates from some article of food being of bad quality." And again, "From what we have observed, we are inclined to think that porrigo is not so contagious as many suppose."

The only circumstance which has at all tended to shake my opinion of the non-contagiousness of ringworm, is that of the occurrence of patches, apparently of this disease, on the neck or arms of adult females who have had the care of diseased children. These patches never exceed three or four in number; usually there is one only. I have never seen them on the scalp; they are easily cured, or soon get well, if left to themselves; and they are not uncommonly met with in those who have not been within reach of children affected with ringworm.

681. *Treatment.*—The indications for the treatment of common ringworm are *firstly*,

To restore the defective powers of the constitution; and *secondly*,

To restore the local power of the skin. And these objects are to be fulfilled by similar means. The first indication calling for improved hygienic conditions; improved diet; and tonic-alterative medicines. The second requiring stimulating applications.

The importance of the hygienic principles, air, exercise, clothing, and ablution, cannot be too strongly urged in common ringworm. When the disorder first appears upon the head at school, the child should be immediately removed, either to a more airy locality, or to the sea-side. I have seen several cases in which the disease has been entirely cured by such a change as this, seconded by a better assorted diet, and by a local application of the simplest kind.

It is much to be regretted that some provision is not made, by those who have the care of the education of youth, for supplying the means of instruction to children labouring under this complaint; for combining, in fact, physical education with mental education, and the advantages of sanatary regulations with both. I am quite ready to admit the necessity of separating boys afflicted with this disorder from others; not, however, from any apprehension of contagion, or with a view of protection to the latter, but that the diseased youths may be placed under a training adapted for their cure. Nevertheless, it is painful to reflect that this isolation is generally accompanied by a total neglect of education, with a loss of months and years wholly unnecessary, and yet which may never be repaired; in some instances, indeed, amounting to the positive destruction of a boy's prospects in life.

I would suggest, as a remedy for this evil, that a school-sanatarium, especially calculated for this object, should be established in some healthy locality, and that the boys assembled in such a school should pursue their studies undisturbed, while the medical discipline necessary for their cure was enforced.

The masters engaged at such a school would be free from any danger of contagion. Indeed, adults are not liable to take the disease under any circumstances. Neither must it be supposed that the assemblage of affected children would be either detrimental to themselves or to those about them.

In speaking of the cause of this disease, I mentioned, as tending to predispose to the complaint, improper diet. I remarked that I had seen cases in which I believed I could trace the origin of the disorder to a too exclusively vegetable or milk diet, and these are circumstances to be borne in mind in regulating the regimen of our patients. As in favus, I should give a preference to a sound animal diet, with a good beer, such as brewer's porter,[1] for drink, and chocolate, cocoa, and tea, in small quantity, for the morning and after-dinner meal. Butter I look upon as highly useful, both in trichonosis furfuracea and favus.

The medicines which are best adapted for the disease are the citrate, acetate, or hydrochlorate of iron; iodide of iron; iron with quinine; nitro-muriatic acid, either alone or with the tincture of cinchona or gentian.

The general functions of the body will require to be regulated in the usual way; but aperients and purgatives are to be used sparingly, and with care. As a laxative, I am in the habit of prescribing the following:—

℞
Confect. sennæ, ℥ij.
Sulphuris sublimat.;
Potassæ bitartratis, āā ℥ss.
M. Omni mane, vel omni alterâ mane sumenda.

If there be enlargement of lymphatic glands, having a scrofulous origin, the oleum jecoris aselli is to be had recourse to, and if there be any want of solidity in the bones, lime-water.

In common ringworm, which is not neglected, there are no crusts to be removed: but should there be any collection of this kind, they are best cleared away with water and soap, after being softened by a poultice, or with the moist compress and oiled silk, as recommended for favus.

Shaving the head is a practice which I rarely have recourse to, nor do I think the advantage which it holds out at all commensurate with its evils. If the hair be moderately short, the head may be washed and kept in proper order, and nothing more than this is required. I do not think that, as a general rule, shaving strengthens the hair. Some time since, while engaged in investigating the structure and phenomena of hair, I compared the hair of persons who had been shaved with that of others in whom that operation had not been performed, and I found no difference between them.

Washing with soap and water, followed by combing with a small-tooth comb, is attended with advantage; the latter process serving to clear away the diseased hairs sufficiently. I have already said that I do not consider these hairs as irritants of the skin, and tending to keep up inflammation, and, therefore, I am not inclined to join with Plumbe in suggesting ingenious contrivances for getting rid of them.

As respects the soap to be recommended in this disease, there is none better than the old-fashioned common yellow soap, a soap of the finest manufacture, but at present out of favour with house-wives on account of its colour; the substitute, a lighter coloured soap, is, however, very inferior. Soft soap has been much in use for washing heads affected with ringworm, but it is offensive and disagreeable, and in nowise superior to the soda-soaps; indeed, I regard it as inferior to the common yellow soap.

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[1] In contradistinction to publican's porter.

When the patches are free from their crusts and loosened hairs, I commence the local treatment by pencilling them with acetum cantharidis, or the acidum aceticum fortius, and then anointing the surface with ceratum simplex cum liquore plumbi (ʒj ad ℥j.) This application I repeat once in the week; and on the intermediate days, as soon as the irritation caused by the acid has subsided, I prescribe a moderately stimulating ointment, such as the unguentum hydrargyri nitratis, or unguentum hydrargyri nitrico-oxydi, diluted one half with the ceratum simplex. Another ointment, which I have found of service, is one composed of sulphate of zinc and ceratum simplex (ʒj ad ℥j;) and I have also obtained good results from the unguentum sulphuris compositum.

A remedy which I have found most useful in common ringworm is the linimentum ammoniæ, accommodating the proportion of alkali to the amount of stimulation which it is desired to effect. Another excellent remedy is the oleum crotonis tiglii, twenty drops to the ounce of unguentum florium sambuci, or unguentum jussis cucumis. The iodide of sulphur ointment, which I have frequently used, I find decidedly inferior to the above remedies.

As the principle of local management of this complaint is cleanliness and moderate stimulation, many additional remedies might be mentioned as applicable to its treatment. Dr. Hamilton recommends an ointment of cocculus indicus, for which picrotoxine might be conveniently substituted. Bateman recommends the unguentum gallarum. Then there is the iodide of sulphur ointment, (gr. x.—xxx. ad ℥j.) But a better remedy than either of these, though somewhat objectionable in private practice, from its dirtiness and bad odour, is the following, originally suggested I believe by Dr. Wilkinson:—

℞
Sulphuris sublim.;
Picis liquidæ:
Axungiæ, āā ℥iv.
Cretæ preparatæ, ℥ij.
Ammoniæ hydrosulphureti, ʒj.
M.

Dr. Walter Dick, in his treatise on Porrigo, recommends for ringworm an ointment of subnitrate of bismuth (ʒj ad ℥j,) to be rubbed into the diseased parts, night and morning, after washing. The same author refers to another remedy once in high repute for this complaint —viz.,

℞
Olei laurini, ℥iss.
Sulphuris vivi, ℥ss.
Pulveris camphoræ, gr. x.
M.

Other remedies, which have been from time to time in vogue are, sulphur ointment and soft soap, equal parts of each; the unguentum sabinæ, spirit of turpentine, &c.; adhesive plaster has also come in for its share of praise.

Plumbe was in the habit in this disease of pencilling the patches with strong sulphuric acid, taking care to wash it off as soon as smarting commenced; his subsequent treatment was simple washing. He was also an advocate for shaving the head. In old-standing cases, where secondary changes had occurred, such as the formation of pustules, and suppuration of the hair-follicles, he preferred that the hair should be cut with scissors, but as short as possible, and he recommended that every hair contained in a follicle in which suppuration existed should be drawn out with the forceps. This is a needless operation; and, indeed, the supposed irritative property attributed by Plumbe to the hairs, the apology for the *calotte*, is altogether unfounded. On the whole, Plumbe's treatment is unworthy of his reputation.

Ointments (greasy applications, as they are sometimes disrespectfully called) are undoubtedly better adapted for ringworm than lotions; but if any insuperable objection should be made to their use, a lotion of sulphuret of potass (ʒj ad Oj,) sulphate of zinc in rose-water (ʒss —ʒij ad Oj,) bichloride of mercury in emulsion of bitter almonds (gr. x. ad Oss.,) &c., might be prescribed. In this case, however, the consequent dryness of the skin should be corrected by cold cream or some simple pomatum.

After the cure of ringworm, there commonly remains for some time, as a consequence of the debility of the skin, a dry and scurfy state of the scalp. The best treatment for relieving this is to dip the head every morning in cold water, and after drying it thoroughly to anoint the skin well with some simple pomatum, such as the following:—

℞
Olei olivarum, opt. ℥ij.
Ceræ flavæ, ʒij.
Attar petalor. rosar. ♏ij.
M.

Where there exist objections to dipping the head in cold water, the scalp should be well dabbed, every morning, with the following lotion, and afterwards anointed with the pomatum, as in the previous case:—

℞
Spir. vini rect. ℥iv.
Spir. rorismarini, ℥ss.
Aquæ rosarum, ℥iiiss.
M. Fiat lotio.

TRICHONOSIS PLICA.

Plica polonica, or Polish ringworm.

682. Plica polonica, so far as I am able to infer from the description of the disease given by authors, is, in its essential nature, analogous to the Common Ringworm of this country. There exists in it, as well as in Ringworm, an enlargement of the diseased hairs, a condition probably depending on the larger size of the nucleated granules; and the latter are the depositories of the morbid fluids which are found in such quantities in that affection. In other words, Plica

is a state of *granular degeneration* of the hair, the granules being turgid with a viscous sanguineous fluid. The state of matting of the hair, which is thought to be peculiar to Plica, has also its analogue in Ringworm; and the conical bundles of which I have spoken, when describing the latter, are the representatives of the greater and more complete fasciculation of the Polish disease.

According to the best authors on Plica polonica, the scalp is inflamed and excessively tender; the hairs are swollen and imperfectly formed; they are tinged with a viscous and reddish-coloured fluid, and the hair-follicles secrete an abundance of this fluid, which agglutinates the hairs, and then by desiccation unites them into a solid mass. The tenderness of the scalp in these cases is so excessive, that the bare touch of a single hair excites pain, and, when cut across, the reddish fluid with which the hairs are surcharged oozes from the divided extremity. This appearance, together with the extreme sensibility, has given rise to the supposition of their being sarcofied, and pervaded with vessels and nerves. The odour arising from a scalp so affected, is described as being exceedingly disgusting; excoriations of considerable extent are frequently formed, and the matted hair becomes the resort of countless pediculi.

Plica is not confined to the scalp, but affects the hair on every region of the body; the nails of the fingers and toes are also changed, becoming rough, fibrous, and discoloured. Left to itself, the disease lasts for ten or twelve months; the symptoms then subside gradually; the hair returns to its natural diameter; and the filthy mass is pushed by degrees further and further from the surface, until it falls off spontaneously, or is cut away by scissors.

The hair presents some modifications, in the manner of its matting, which bear relation to its length. Thus, in males who wear the hair short, numerous locks are matted separately, constituting the variety known as *Plica multiformis;* at other times, the matted hair forms a single coil, the *Plica caudiformis;* or, again, it may constitute a large and irregular mass without order in its matting, the usual character of the disease in women.

Several authors have asserted, that in the majority of cases, the scalp is not affected in Plica, and that the alteration in the hair occurs at a certain distance from the integument. This assertion is incredible, and it seems more reasonable to conclude, that in the cases adduced in support of this statement, the disease was advancing towards cure, and consequently that the morbid mass of hair was removed by growth from the surface of the scalp. A recent writer on this subject, Dr. Bidder,[1] makes the following remarks:—During the past summer, I remained for several weeks in a country where Plica polonica is frequent. The disease occurred only in a mild form. In all the cases which I examined, about twenty in number, I found the hair, for a distance varying from half an inch to one inch from the scalp, perfectly natural; one would have believed that the disease had been removed from the head by the growth of the hair. The scalp was perfectly normal, being neither reddened, swollen, nor increased in sensibility, so that disease of the hair would appear to be capable of existing independently of disorder of the scalp in which the matrix is imbedded.

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[1] Müller's Archiv., 1840.

"I also had an opportunity of observing the process of separation of the diseased from the sound hair. Two individuals presented themselves in whom the morbid mass had fallen by spontaneous separation —a rare occurrence. Once alive to the possibility of such a process, I soon discovered in two cases a groove as though made by a ligature around the cylinder of the hair, and forming a perfect line of demarkation between the healthy and diseased portion of the hair. In some hairs, the groove resembled a mere crack; in others, it had proceeded so far that the separation was nearly effected. In other cases, I was unable to discover the line of demarkation.

683. *Causes.*—Supposing my opinion to be correct with regard to the nature of the disease, its causes will probably be found to be analogous to those of Ringworm. The disorder is most prevalent on the banks of rivers and in the marshy districts of Poland, in which it appears to be endemic. It is met with, as is Ringworm, among the noble[1] and the wealthy, as well as in the poor; and, unlike Ringworm, it occurs in adults as well as in children.

[Cryptogamous growths have been found by some observers in this disease. Gunsberg first noticed them between the root-sheath and the hair; in the pith of the hair as well as in the epithelial investment. The presence of the growths gave rise to the following alterations in the hair:—thickening of the root-sheath; tumefaction of the medulla of the hair; forced commingling of the different hair-fibres, and splitting of the hair; thickening of the epithelial investment, and sequestration of many of the hairs. The growths consist according to him of spores and thallus threads. The first are oval, and lie separately or in heaps alongside each other. The thallus threads are in much smaller quantity.

Similar cryptogamous growths have been observed in plica by Von Walther. He never saw them, however, in the hairs as Gunsberg did, but between them, and could in no case detect them in recent cases.

Münter was never able to discover them, nor was G. Simon more fortunate. (G. Simon, *Die Hautkrankheiten*, &c., s. 340 and 385, Berlin, 1851.)]

684. *Treatment.*—The treatment which is applicable to Ringworm I should conceive to be suited also to Plica. Change of air, improved diet, and altered hygienic conditions must be indubitably necessary, and the same tonic alterative medicines. A prejudice seems to prevail in Poland against the removal of the mass by mechanical means, which I am inclined to think unreasonable. I should certainly suggest the trial of moderately strong stimulating local remedies.

VI. DISEASES OF THE HAIR-FOLLICLES.

685. The hair-follicles and hairs are so intimately allied, the latter being a product of the former, that it is difficult to understand how

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[1] In one instance, I saw a mass of matted hair which had been cast from the head of a Polish lady of noble birth.

disease can be present in one without at the same time involving the other. Practically, this difficulty is solved by the fact, that the follicles may be deranged in their function without any alteration being manifested in the structure of the hair. But the reverse of this position is not equally true; for in that greater morbid change, which is the cause of alteration in the structure of the hair, the follicles suffer to a greater or less extent. Hence, while the designation "diseases of the hair-follicles" must be regarded as applying solely to those organs, "diseases of the hairs" may be supposed to implicate the follicles also. There is another point upon which some elucidation is required: the term hair follicle, when considered pathologically, must be supposed to apply only to the free portion of that canal, and to include the sebiferous ducts.

686. The diseases of the hair-follicles, which I have thought worthy of separate consideration, are two in number, namely—

Inflammatio folliculorum,
Favus.

INFLAMMATIO FOLLICULORUM.

687. Inflammation of the hair-follicles is indicated by an erythematous blush of redness of the skin, dryness, and the production of a large quantity of furfuraceous scales. There is, besides, considerable itching, and more or less decadence of the hair. This condition of the follicles is not unfrequently the forerunner of a morbid secretion, which is diffused, and hardens upon the surface of the scalp. The following is an example of the disease.

688. A naval medical officer, while serving in the West Indies in 1833, suffered from an attack of erythematous patches upon the crown of the head. They were attended with itching, and by a copious furfuraceous desquamation, the itching being much increased at night. In 1837, on his return to England, the disease presented occasional exacerbations, but never at any time disappeared entirely. In 1838, while on the Pacific coast of South America, frequently exposed to a tropical sun, and undergoing considerable fatigue with copious perspirations, the patches coalesced, and poured out "an unctuous exudation of a dark reddish colour." At this time, also, the loosening and fall of the hair, which has continued until the present time, was first noticed. "Previously to my return to England in 1839," this gentleman observes, "large sebaceous incrustations covered the crown of the head in patches varying from the size of a sixpence to a shilling; the scales became thicker, attended with an exceedingly disagreeable feeling of heat and itching. They were in a state of continual decadence and renovation. I had my head shaved for two or three months, and while the hair remained short, I was effectually relieved from the disease."

As soon as the hair was allowed to grow, the disease returned, and in 1840, while stationed at the river Plata, he was again shaved, and continued the practice for four months. In 1841, whilst in China, he had recourse to shaving for the third time. "During our operations," he remarks, "in the Yeang-tes-keang, the heat was most intense, the thermometer ranging from 90° to 95° in the shade. I think the disease, at this time, attained its greatest pitch of intensity, which I am induced to attribute to the impaired state of the digestive functions, as I was confined for months exclusively to the ship, and of course debarred all suitable exercise. The scales at this time assumed a gummy character, tenaceous and soft; the itching was particularly annoying, but was somewhat relieved. I passed eighteen months on the East India station without any alteration in the character of the complaint.

"During my stay in England in the winter of 1844-45, I tried preparations of the nitrate of silver, iodine, dilute hydrocyanic acid, and I persevered in the use of the tincture of iodine applied locally during the voyage to Van Dieman's Land last year without any benefit; and during my return I used most assiduously the bichloride of mercury, which relieved the itching for a short time.

"I am unable to account for the commencement of the disease, nor was I during its progress sensible that climate produced any material alteration in its character. Heat and itching were the usual concomitants, and they were at times so annoying that I was obliged to apply soap and water frequently during the day, which always afforded me temporary relief. Stimulants always increased the itching.

"A deceased brother was similarly affected, but he never lost his hair, and I am the only one of my family who has felt its decadence, although many of my progenitors have lived to a very old age.

"Notwithstanding the different remedies resorted to, the disease assumed that inveterate form which you saw when I had first the pleasure of consulting you in February last. Since I have been under your treatment, the disease has gradually yielded to the means you have employed. The patches, after your second application, sunk to the level of the surrounding integuments, the squamæ have not been reproduced to a hundredth part the extent that they were before, the few remaining patches have gradually lost their hardness and redness, and are now resuming the character of healthy integument. I feel that the hair has been in a slight degree reproduced."

689. In some instances, the inflammation of the follicles is so slight as to escape attention altogether; and the disease does not come under the attention of the surgeon until the altered secretion has been poured out upon the skin, and forms a concretion of variable thickness and extent. To this stage of the complaint I have assigned the name of *stearrhœa folliculorum*. The crust presents some variety in point of colour. It is often yellowish, and resembles the film which drying-oil leaves after desiccation, and sometimes is grayish and greenish in its hue. Occasionally, this state of the scalp is associated with dryness of the skin, and then the hair is dusty and sordid; but, more frequently, there is no such appearance.

The symptoms by which the patient discovers the presence of disease are, itching, frequent, often intense, and sometimes constant, and fall of the hair.

690. There is another state of the scalp, *narcosis folliculorum*, de-

pending on chronic inflammation of the hair-follicles, which is far from being uncommon, particularly in women and children. In this disorder, the scalp and hairs are found covered with a yellowish and dirty-looking powder, composed of an admixture of granular particles and furfuraceous scales. Masses of this granular substance are collected at the mouths of the follicles, while others are threaded like beads upon the hairs. By brushing, the skin may be completely cleansed of this pulverulent substance, but the granular patches still remain threaded on the hairs, and adherent to them, at the mouths of the follicles. If a hair be withdrawn, its follicular portion will be seen to be enclosed in a small sheath of desiccated epithelium or sebaceous substance, which extends almost to its root. Moreover, the root is slender and dry, and the entire hair looks parched and starved.

The symptoms which denote the existence of this complaint to the sufferer are the difficulty of cleansing the hair, a moderate degree of itching, and particularly the falling of the hair, which comes off in large quantity. The falling of the hair is easily explained; the torpidity of action, which gives rise to the production of a dry sebaceous matter, and a dry and pulverulent epithelium folliculi, extends its influence to the growing hair, which is deprived of its moisture and of its hold upon the follicle, and therefore falls before the slightest force. Another change depending on the same cause is not unfrequently observed in this disease—namely, grayness of the hair.

691. When the torpor of the follicles occurs upon the general surface of the body, it interferes, more or less, with the growth of the hairs, and is termed *morbus pilaris.* In this affection, the hairs become imprisoned within the follicles by the formation at the mouth of the latter of a small mass or film of hardened sebaceous matter; and as the hairs continue to grow in spite of this impediment, they are gradually twisted into a spiral coil, (Plate 6, fig. 10,) which may be seen at the mouths of the follicles. A number of little pimply elevations are in this manner produced, each elevation corresponding with a coiled hair; and if the apex of the pimples be rubbed off, the twisted hair will at once be exposed. This disorder is most frequently perceived on the legs and thighs. Turner remarks, that in children it is often met with on the back. It is attended with itching, and occasionally with acute lancinating pains, comparable to the piercing of the skin with a sharp needle.

692. *Treatment.*—The treatment of the three preceding forms of disease consists in the employment of moderately stimulant remedies locally; and for the most part tonic medicines constitutionally. Of course, the common indications of disorder of stomach, kidneys, or uterine function will not be passed over. In the case of the naval surgeon reported above, (§ 688,) I found it necessary to modify the action of the skin by blistering the surface occasionally with the acetum cantharidis, and afterwards employing the pomatum stimulans. Indeed, the latter preparation I find invaluable in this class of diseases. It should be sufficiently strong to keep up a moderate action in the skin. Another excellent remedy is the emulsion of ammonia and olive oil. In some instances a stimulating lotion may be pre-

ferred to oleaginous remedies, but in this case the skin must be kept moistened with cold cream or some simple pomatum.

FAVUS.

Syn. *Crusted or honeycomb ringworm. Kerion. Porrigo lupinosa.* Willan. *Tinea lupinosa. Tinea favosa. Tinea maligna. Teigne faveuse.* Alibert. *Porrigophyta.* Gruby.

693. Favus (Plates 14-15) is characterized by the presence of crusts, of a bright yellow colour, scarcely rising above the level of the skin, covered by epiderma, exactly circular in shape when distinct (favus dispersus,) bounded by an outline representing numerous arcs of circles when confluent (favus confertus,) depressed or slightly cupped on the surface, and pierced in the centre by the aperture of a hair-follicle which gives passage to one or two hairs. To these the special characters of favus may be added, more or less redness surrounding each crust and cluster of crusts, a ragged and exfoliating state of the epiderma of the adjoining skin, a thin and glazed appearance of those parts of the scalp on which the disease has exhausted its violence, and a loss of hair in irregular patches.

Favus is a disease of the scalp; but, in some few instances, has been observed on other parts of the body.

Its crusts are altogether unlike those of other cutaneous diseases. They are situated, *not upon*, but *under* the epiderma, and as a consequence of this peculiarity of position, they are smooth on the surface, and very little raised above the level of the skin. They are not the result of a desiccated morbid secretion poured out by a broken or ulcerated surface,[1] the disease, in fact, being unaccompanied by discharge of any kind, but are formed of a peculiar substance, a remarkable and peculiar modification of cell-formation and growth.

The yellow colour[2] of the crusts of favus is a striking feature of the disease; the yellow is much brighter than that of pus, and this character enables us to discover the first traces of its appearance around the apertures of the affected hair-follicles. At this early period, the yellow substance may be seen forming a yellow ring of equal dimensions around the margin of the hair-follicle; it is quite evident that it is separated from the hair by the epidermal lining of the follicle; indeed, the aperture of the follicle is free, and generally remains so throughout the entire growth of the crust, and no pressure exerted upon the skin can force through it the morbid formation.

The growth of the crust is eccentric, fresh matter being deposited in successive rings around that which was first formed, the breadth of the ring undergoing a gradual increase. This mode of growth is conspicuous on the surface of some of the crusts wherein the first formed rings have become altered in colour from desiccation, and their outlines may be distinguished as a series of reddish-brown and concentrically arranged lines. The alteration of colour here referred to being the effect of desiccation, the whole central part of the crust assumes more or less of a reddish-brown tint.

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[1] Bateman is consequently wrong in speaking of the crusts as being formed "by the concretion of the fluid which exudes when they (the pustules) break."

[2] From leaning with too much reliance on the older writers, Bateman has fallen into the mistake of calling the crusts "yellowish white" and "white." The source of his error is the following quotation from the Arabian author, Haly-Abbas:—"Quinta est lupinosa, sicca, et *colore albâ.*"

This mode of growth of the crusts also gives rise to another of its characters, namely, the depressed centre which has gained for the disease the appellation of favus (honey-comb.) But it is ludicrous to compare the slightly depressed and precisely circular crusts of favus with the deep hexagonal cells of the honey-comb; and we cannot but regret that the scientific denomination of the disease is so little appropriate. The first formed rings of favous matter naturally shrink as the latter loses its fluid by desiccation, but the last formed ring, retaining its moisture, is brighter coloured and more prominent than the rest, and is the chief cause of the central depression of the crust. Occasionally the central part of the crust, namely, that which immediately surrounds the hair-follicle, forms a slight prominence, and destroys the exact concavity of its surface.

The crust at its outer margin gradually sinks to the level of the surrounding skin, and the epiderma passes from one to the other without change.

Such is a description of the crust when uninjured and entire, but in many instances, its surface, being dry and brittle, cracks in a circle round the hair, in consequence of the contraction of the favous matter during desiccation, and the component substance of the crust is more or less exposed to view. Occasionally, the central follicular piece of the crust becomes loosened from the rest, and either adheres to the hair or is drawn upwards on its shaft, and has the appearance of being strung like a bead upon its thread. The exposed substance of the crust is lighter coloured (cream coloured) than its surface, and more or less broken into small masses, according to its degree of dryness. It is this latter character that Bateman alludes to when he says that the "central indentation or depression sometimes contains a white, scaly powder." It will be seen at once that Bateman is wrong in this expression, for the surface of the crust is gone before the disintegrated appearance alluded to comes into view, and then even it is not a "scaly powder." This remark of Bateman's is evidently the "a quâ quasi cortices et squamæ fluunt albæ" of Haly Abbas.

In its early development, the crust of favus is exactly circular, and it maintains this form with remarkable accuracy, even when neighbouring hairs are implicated in its progress, so that it sometimes happens the crust is transfixed by several hairs, one or two being central and representing the starting point of the morbid action, the others being more or less peripheral. Occasionally, two or three crusts approximate in their growth and become blended by their margins; and in the aggregated form of the disease (favus confertus,) a number are thus united together. In the aggregated mass, however, the circular form and depressed centre of the originally separate crusts are still perceptible.

The size of the crusts is something less than a quarter of an inch in diameter, namely, between two and three lines. Bateman speaks of them as acquiring the size of a sixpence, which is incorrect.

694. Passing now from the outward characteristics of this disease to the relation subsisting between the morbid formation and the skin, we find that if, with a little care, we break through the epiderma around the margin of the crust, we are enabled to raise up and remove the entire crust without drawing blood or injuring the skin. And if we perform this manipulation after the removal of an oiled-silk covering or poultice which has been allowed to remain on the head for a few hours, we may succeed in peeling off the whole of the crusts without pain to the patient, and with the utmost facility, the crusts being unbroken and retaining their exact form. Moreover, in the course of withdrawal, the crusts will be unthreaded from the hairs, leaving the latter behind standing firmly in their follicles.

In this manner we are enabled to demonstrate that the under surface of the crust is smooth and convex, and of a honey-yellow colour, and that there is frequently a prominent papilla, corresponding with the aperture of the follicle of the hair, which projects from the centre of the convexity. The crust is thick throughout its entire extent, but thicker in the middle than at the periphery, and at its thickest part measures from one-half to one-third of a line.

On the surface of the derma there exists a depression corresponding with the dome-like convexity of the under part of the crust. This surface is smooth, shining, and red; and is evidently constituted by the basement membrane, which is transparent, but somewhat thickened. In the centre of the depression is the aperture of the hair-tube unaffected by the morbid action; and if the hair be withdrawn, it is evident that it has no direct participation in the disease. The under surface of the compound crusts displays the numerous domes of the originally separate crusts, and the impression on the derma is that of a number of cups divided from each other by prominent partitions.

The structure of the derma has obviously suffered absorption from the gradual and prolonged pressure which has been kept up on its surface. The derma has become very greatly thinned, all trace of papillæ is lost, and the hair-follicles are considerably shortened. A further continuance of this pressure, occasioned by a further addition of favous matter to the under part of the crust, would entirely obliterate the hair-follicles, and then the formation of hair would cease. This is the explanation of the loss of hair which takes place in favous disease.

After the removal of the crusts, it is curious to observe how quickly the compressed derma becomes lifted up. In the course of a few hours, the depressions are almost effaced, and a film of epiderma is formed upon their surface. But if the pressure have been great or of long duration, the normal level is never completely regained, and the skin frequently retains its thinned and atrophied character for the rest of life. The papillæ of the derma having been destroyed, the restored surface is unnaturally smooth and covered by a transparent and flaky epiderma, which is repeatedly thrown off by desquamation. The injured hair-follicles admit of no regeneration, and the diseased spots therefore remain permanently bald.

The colour of these altered patches of skin is that of a portion of integument which has long suffered under chronic inflammatory action; in relaxed constitutions, the veins are dilated, and the torpid circulation gives rise to a blueness and lividity of hue. In more healthy states of the system, the tint of colour is reduced below that of the surrounding surface, in consequence of the diminished amount of the capillary rete of the skin.

According to the preceding observations, the precise seat of the morbid formation of favus is the surface of the derma. The morbid substance lies in contact with the basement membrane of the derma on the one hand, and with the epiderma on the other. From the derma, as I have already shown, the favous substance is easily separable; but, with the epiderma, it is closely identified. Its relation to the epidermal lining of the follicle of the hair is similar to that of its connexion with the epiderma.

695. *Pathology.*—When we proceed to the anatomical analysis of a crust of favus, we find it to present some diversity of texture in different parts of its thickness. The upper surface, for example, being combined with the epiderma, evinces the laminated disposition of that membrane, and is brittle from its dryness. The deep surface is of a darker yellow than the rest, of a honey-yellow colour, as I have elsewhere remarked, and conspicuous for its density and toughness; tearing with difficulty when dissevered by needles for microscopical examination. The middle portion, which constitutes the greater bulk of the crust, is cream-coloured,—becoming, however, as yellow as the deep surface when moistened—and broken up into small irregular masses, like mud which has been exposed to the sun to dry.

Under the microscope, these three divisions of the crust, namely, its deep, middle, and superficial portions, present differences of structure which I shall now proceed to describe.

The *deep* portion is composed of globular corpuscles, measuring $\frac{1}{5000}$ to $\frac{1}{3000}$ of an inch in diameter, closely collected together and forming the outward boundary of the crust. Each corpuscle is constructed of a cell-membrane enclosing numerous very minute secondary cells ($\frac{1}{10000}$ to $\frac{1}{8000}$ of an inch;) and the latter are formed of several minute transparent granules ($\frac{1}{20000}$ to $\frac{1}{12000}$ of an inch.) In the centre of each of the secondary cells is a dark point, which might be regarded as a nucleus, but which, in reality, is merely the shade caused by the approximation of the elementary granules of which it is made up.

The *middle portion* of the crust is composed of corpuscles much larger than the preceding—namely, between $\frac{1}{2500}$ and $\frac{1}{1500}$ of an inch in diameter, and consisting of a cell-membrane, containing from four to seven or eight nucleated granules; of nucleated granules ($\frac{1}{4500}$ of an inch,) separate and in groups; and of other nucleated granules connected together in a linear series, and assuming a branched and plant-like form.

The *superficial portion* is remarkable only for the large size of the nucleated granules and for the more highly developed condition of the plant-like growth. In it there are no corpuscular cells.

In its essential nature, I believe the peculiar matter of favus to be a modification of the elements of the epiderma. The grounds upon which I found this view I will now proceed to explain.

The epiderma is originally a plastic fluid, which goes through the successive forms of elementary or primitive granules, aggregated granules, nucleated granules, and cells, before it attains its ultimate condition of flattened scales.[1]

Now, the favous matter is necessarily in a fluid state when first effused through the capillary vessels on the surface of the derma, and in its freshly elaborated condition consists of granules possessing a simple, aggregated, and nucleated shape, and cells. I have ascertained the presence of these elementary forms. The primitive granules measure from $\frac{1}{20000}$ to $\frac{1}{12000}$ of an inch in diameter; the nucleated granules measure $\frac{1}{4500}$; and the cells between $\frac{1}{5000}$ and $\frac{1}{3000}$.

The primitive granule is the first organic shape of the plastic fluid effused by the blood, and the process by which that shape is assumed is a kind of vital coagulation or vital crystallization. It is endowed with an independent life, and is capable of acting both alone and in combination with similar granules. It separates from the plastic material by which it is surrounded the elements of growth, and attracting towards itself other granules, forms an aggregated granule; the aggregated granules performing similar actions, constitute nucleated granules; and several of the latter combining in a like manner and forming around themselves a peripheral boundary, constitute a cell. The growth of the cell is the result of the vital agency of the whole of the contained primitive granules. These granules draw nutritive material from the blood, which nutritive material serves the double purpose of contributing to their own growth and giving origin to new granules, so that the same changes occur within each cell as had taken place in the plastic fluid poured out on the surface of the derma.

Reasoning from analogy, the mode of development and growth of a cell must be the same in whatever part of the body it is produced, and whatever special purpose it may have to perform; and microscopical investigation establishes the existence of an identity of structure among them. The blood-cell, the mucus-cell, the pus-cell, the pigment-cell, the epithelial or epidermal-cell, for example, resemble each other closely in construction, and in some instances appear to be convertible the one into the other. The cells or corpuscles of favus possess a striking resemblance to pus-cells, and excepting in their form, are closely allied to young epidermal-cells; so that it would require no stretch of imagination to suppose the epidermal cell, altered in its action by disease, capable of assuming the character of the pus-cell; or the latter, from a similar cause, passing into the likeness of a favus-cell.

In the early development of favus, it is no uncommon thing to see around the aperture of a hair-follicle a circle of pus in place of favous matter. There is no difficulty in distinguishing between the two, for pus is much lighter coloured than the matter of favus, and when the epiderma is punctured, issues from its cavity in the form of a drop.

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[1] § 14, page 51.

In a very short time, however, this little collection of pus loses its characteristic colour; it becomes, as it were, dried up, is no longer recognisable as pus, and merges into the yellow crust of favus. Now in this fact we have evidence that the same tissue may produce, one while epidermal-cells; another while, pus-cells; and thirdly, favus-cells. Can we close our minds against the signification of so remarkable a phenomenon?

The fact of pus being so easily distinguishable from the matter of favus, may, at first sight, appear to offer a contradiction to the analogy which I am seeking to establish, but the difference between the two is more apparent than real. Pus is fluid, from the presence of a large quantity of water, and this dilution with water necessarily alters the colour and modifies the development of the corpuscles. Favous matter, at its softest, appears in the state of a paste.

A drop of pus from the situation referred to was composed of globular corpuscles $\frac{1}{3000}$ of an inch in diameter, floating in liquor puris. The corpuscles presented the ordinary granular appearance of pus; but when water was added they swelled to the size of $\frac{1}{2000}$ of an inch; and in place of the minutely granular structure which they previously had, displayed in their interior from four to seven or eight large granules or nuclei. I will not stop to inquire by what means this change was effected. Imbibition of water was evidently one of the phenomena, but what the process might have been by which the minute granules, or rather cells, which were previously seen, were dispersed, is a matter of no importance to the present investigation.

Now the corpuscles which form the deep layer of the crust of favus are composed of seven or eight granules, which represent the nuclei of the cell. The size of the granules varies between $\frac{1}{10000}$ and $\frac{1}{5000}$ of an inch, while that of the entire cell is $\frac{1}{3000}$. So that these cells correspond very accurately with the multi-nucleated pus-cells, the only difference between them being the distention of the cell-membrane of the pus-cells with water.

It is interesting to observe the development of these favus-cells as they become displaced by successive formations, from the surface of the basement membrane, and proceed onwards towards the centre of the crust. The nuclear granules gradually enlarge until they attain the $\frac{1}{4500}$ of an inch, a size nearly approaching the bulk of the original cell; and the cell in which they are contained measures between $\frac{1}{2500}$ and $\frac{1}{1800}$ of an inch. At this period, the function of the cell apparently ceases, for its membrane becomes broken and lost; many of the nuclei are dispersed, but many also remain adherent to each other, and may be observed in linear groups of two, three, and even four or five, already assuming a plant-like character.

In recapitulating the changes referred to in preceding paragraphs, it would appear that the vital force inherent in a plastic fluid is employed in the development of molecules of extreme minuteness—primitive granules; that these granules combine and co-operate for the formation of cells; and that the aim of the cells is the production of nuclei or secondary cells. We will now examine these secondary cells, and follow the subsequent changes which take place through their means.

It is quite evident that these secondary cells are themselves nucleated. In some instances, a single nucleus only is perceptible; in others, two; and in others again, three. When two nuclei are apparent, the secondary cell assumes an oval or oblong form; and when there are three, it has a three-cornered shape. As soon as the cell has attained an elongated form, a slight contraction is apparent around its middle, and a septum is thrown up which divides it into two cells; in a short space of time, each of these cells develops two nuclei, which at first separate, and are finally parted by a septum, as in the previous case; a third repetition of similar actions might convert the four into eight cells, and in this way an elongated stem is produced, which has all the appearance of a vegetable formation. When, in place of two, three nuclei are developed at the same time, the stem has a dichotomous character, and seems to have resulted from the growth of two branches from one stem; and the occurrence of a trinucleated cell in the course of growth of a stem is the usual origin of a branch.

When the process of growth which is here described is accompanied by an active nutritive force on the part of the cells, the cellated stems maintain the original diameter of the cells from which they spring. But when the nutritive force is less active, or the growth is more energetic, then the stems dwindle in size in a corresponding ratio. This, I apprehend, is the signification of the considerable range of variety in breadth which these stems exhibit; the thicker ones measuring $\frac{1}{3000}$ to $\frac{1}{4500}$ of an inch, and the smaller $\frac{1}{15000}$. It certainly has no reference to trunks or branches, as the idea of a vegetable growth might suggest.

The thickest and largest cellated stems are found in the upper portion of the favous crust, the most slender in its deeper portion; while in the middle portion, stems of every intermediate size are found mingled with secondary cells in vast numbers. These, namely, the stems and secondary cells, together with the primary cells and primitive granules, being the real constituents of the crust.

The stems offer some slight differences in relation to the contents of their cells; in some, and especially in the large ones, the contents are transparent and the nuclei manifest, while in the smaller stems they are finely granular.

The resemblance which the cellated stems of favus bear to some of the inferior vegetable organisms, and especially to the mucedines, has caused them to be considered as plants. They have been described as originating in the cortex of the crust and growing inwards to the centre, as giving off numberless branches, and producing seeds or sporules in vast abundance; the so-called sporules being the secondary cells of the previous description. With all these plant-like characters, hypothesis speedily reached the conclusion that the sporules must be the means of disseminating the disease; in other words, were the elements of contagion. Now, I think, that any one who has followed with attention the argument contained in the preceding history, will agree with me that mere resemblance to a vegetable formation is not sufficient to constitute a plant. The statement of the origin of the vegetable formations by roots implanted in the cortex of the crust is unfounded, the secondary cells bear no analogy to sporules or seeds, and it is somewhat unreasonable to assign to an organism so simple as a cell the production of seeds and reproduction thereby, when each cell is endowed with a separate life and separate power of reproduction.

Again, it has heretofore been assumed that the favous matter was contained in the hair-follicles, and consequently communicated with the exterior; an assumption which rendered the idea of a plant-like formation the more probable. But if, as I have shown, the favous matter is sub-epidermal, and has no communication with the exterior, it will be necessary to admit the production of a vegetable organism within the animal tissues before such a phenomenon can be received as possible. The mucedinous formations which have been described hitherto as having been discovered in the animal body, have always been found on the surface of membranes, and not in the substance of tissues, as is the case with favus.

[Dr. Carpenter (*Principles of Human Physiology*, 4th Am. ed., p. 598, Philad., 1850,) has strong doubts of the vegetable nature of the crusts of favus. "It has been assumed," he remarks, "that the organization is vegetable, merely because it consists of a mass of cells capable of extending themselves by the ordinary processes of multiplication. But it must be remembered, that the cellular organization is common to animals as well as to plants; being the only form that manifests itself at an early period of development in either kingdom, and remaining throughout life in these parts which have not undergone a metamorphosis for special purposes. Hence to speak of *Porrigo favosa*, or any similar disease, as produced by the growth of a plant within the animal body appears to the author a very arbitrary assumption; the simple fact being, in regard to this and many other structures of a low type, that they present the simplest or most general kind of organization. Their nature must be decided by their chemical constitution; and this, in the case of the *Porrigo favosa*, appears to be unquestionably animal." Yet M. Gruby ranges the fungus in the genus Mycoderma of Persoon, declared by Fries to be obsolete; J. Müller refers it to the genus *Oidium*, and Zebert, adopting his view, calls it *Oidium Schoenleini;* whilst Remak, by the advice of Zink, makes it into a special genus under the name *Achorion Schoenleini.* (Simon, *Die Hautkrankheiten*, s. 393, Berlin, 1851.)]

In chemical composition, the crusts of favus, according to the analysis of Thenard and Chevillot, consist of—

Albumen	70 parts
Gelatine	17 "
Phosphate of lime	5 "
Water	3 "
Loss	5 "
	100

696. *State of the hair in favus.*—In a preceding paragraph I have stated that the hair remains standing in its follicle when a recent crust is removed, and, I may add, that if it be drawn out, it will be found unaltered in appearance. It is only when the favous matter has in-

creased to the extent of obliterating the follicle that the hair falls. If the obliteration of the follicle be complete, no new hair is formed, but if it be only partially destroyed, then a hair may be produced of smaller diameter than the original hair, or somewhat lighter in colour. It is unreasonable to expect that so serious a disturbance of cell-formation, as that which occurs in favus, can exist in the scalp, without interfering in some manner with the structure of the hair, itself a product of cell-formation. Such an interference does really take place, and the nature of the morbid alteration I shall now proceed to explain.

When a hair from the midst of a crust of favus is placed under the microscope, it is seen to be traversed in the direction of its length by a number of cylindrical tubes measuring in diameter $\frac{1}{10000}$ of an inch. A close examination shows that these tubes are divided by transverse septa into small spaces a very little longer than their breadth, and are filled with air. Now, an observer imbued with the vegetable theory of favus would be likely to conclude that these were the stems of a mucedinous plant, and so indeed they have been considered. They have also been described as branching dichotomously, an assumption altogether unfounded in fact.

To understand the true nature of these tubes, it is necessary to go back to the structure of the hair. The middle or fibrous layer of the hair is composed of oval-shaped cells, closely packed together, and arranged in a linear order. These cells are identical in structure with the cells of the deep stratum of the epiderma—that is to say, they are composed of granules congregated around a central granule, which constitutes the nucleus of the cell. When examined with the microscope, it is not in all cases easy to discover the cells, but their component granules are always obvious, and from the plan of disposition of the cells and their oblong shape, the granules have a linear arrangement, and assume the appearance of fibres. The hair-fibres offer some variety of appearance according to the focus in which they are viewed. For example, with a superficial focus, the peripheral granules are alone seen, and the hair appears to be entirely composed of granules arranged in single rows. With a deeper focus, the rows of granules appear to be associated in pairs, each pair having between them an unconnected row of dark and apparently nuclear granules. In this view, the fibres resemble very closely a chain composed of open links. While, with a still deeper focus, the centre of the cell, with its nucleus and granular periphery, is brought into view.

Now the hair-fibres here described are composed of cells arranged in a linear series, and the cells are filled with a homogeneous albuminous substance, having a certain consistency, and possessing the characters of a solid. Under the influence of disease, the contents of the cells are so far modified as to be deposited in a fluid form, and the subsequent evaporation of the fluid, during the growth of the hair, leaves the fibres hollow and empty, and to all appearance tubular. This is the explanation of the hollow tubuli which are found in the structure of the hairs in favous disease; generally they are distributed in small numbers throughout the thickness of the hair, and produce no influence on its shaft: when more numerous they occasion th lightness of colour of the hairs before mentioned and their somewha shrivelled appearance. But it is evident that they offer no analog with the plant-like formation of the crusts of favus. When the hair present the tubular structure to any great extent, they become brittle, and are easily broken.

697. *Symptoms of favus.*—The early part of the course of this disease is attended by a moderate amount of itching. At a later period, when the crusts have enlarged, and are producing pressure on the inflamed skin, the scalp is tender and painful, particularly in resting the head on the pillow at night. When the disease is sadly neglected, the pressure of the crusts, together with scratching with the nails, may give rise to ulceration, and, according to the French writers, these ulcerations have been seen extending even to the bones of the cranium. The dried crusts give out a peculiar odour, like that of mice; and when the skin falls into a state of ulceration the discharge is said to be most offensive (compared by Alibert to the urine of cats,) and pediculi are apt to be engendered in numbers.

When the state of irritation and inflammation of the scalp are great, the occipital and cervical lymphatic glands are apt to become painful and enlarged. This is a common circumstance in inflammation of the scalp, and one that I have had frequent occasion to observe even in cases of inflammation artificially excited. I make this remark because some dermatologists would lead us to infer that enlargement of the lymphatic glands of the neck was pathognomonic of favus. In the most severe and neglected cases of favus, the inflammation of the lymphatic glands has gone on to suppuration and ulceration.

698. *Causes.*—Favus is a disease of deranged nutrition, and generally occurs in childhood, at a period of life when the nutritive functions are most active, and when, as a consequence, they are most susceptible of disturbance. At this age, any circumstance which may tend to reduce the powers of the system may become a pre-disposing cause of favous disease. Favus is generally met with among the children of the poor, and in those institutions for the children of a better class, that are so mismanaged in respect of diet, clothing, ventilation, and cleanliness, as to engender a disposition to disease.

The more frequent occurrence of favus in France than in England is, I believe, attributable to the greater poverty and wretchedness of the lower classes in the former country, added to a practice which is happily almost unknown in England—namely, the putting out of the children to nurse. The remark has been handed down, from author to author, that children afflicted with favus remain stunted in their growth, are slow in displaying the changes which take place at puberty, and are wanting in their intellect. "I have seen," says Biett, "individuals affected with this disease evince no signs of puberty at the age of twenty, and even more."

In my opinion, these phenomena of retarded development are not the effect, but a part of the general deficiency of power—in other words, of the defective nutrition, which is the real cause of the disease.

699. *Is favus contagious?* The transmitted records of the older writers and modern authors both agree in according to favus a high degree of contagious power. The supporters of the vegetable theory of the disease are still more ardent in this belief; for, with a distinct mucedinous growth and a host of sporules, it would be hard indeed if the disease were not susceptible of propagation. This theory will also win admirers and disciples from the simple and truth-like explanation which it seems to offer of the manner of transmission.

The seeds are conveyed directly to the soil in which they take root and grow; they are carried by combs, or brushes, or hands, or they are wafted by the winds. Gruby made the contagious property of favus the subject of experiments; he inoculated with the substance of the favous crust mammiferous animals, birds, reptiles, insects, and himself, but without any success. He also inoculated vegetables with the same matter, and, after seventy-six trials, he found a mycodermis similar to that of favus produced on a cryptogamic plant.

I am exceedingly doubtful of all that has been recorded with regard to the contagiousness of favus. The experiments of Dr. Gruby prove nothing in its favour, for the instance to which he refers is merely one of the formation of a mucedinous plant, in other words, of a crop of mould, upon a wounded cryptogamic plant. The identity of this mucedo, with the "porrigophyte," or plant of favus, being far from being established.

[Remak and Dr. J. H. Bennett succeeded in inducing the disease by inoculation; but Fuchs, Gruby, Vogel and others failed. G. Simon introduced portions of the crust of porrigo into small incisions made in the neck, in two boys, but without success.]

The seat of development of favus affords a common-sense negative to the notion of propagation by seeds or sporules; and if it be true, as I have endeavoured to prove, that the plant-like production has nothing in common with plants but its form—a form which is as constant in animal structures as in plants—the vegetable theory of the disease must necessarily fall to the ground.

I will now adduce a different line of argument. In the course of my long connexion with the St. Pancras Infirmary, I have seen not more than six cases of favus; in no one instance was there reason to suspect the disease to have originated in contagion, and certainly there was no example of its transmission to others. In a well marked illustration of this disorder, the features of which I have preserved by delineation,[1] the patient, a boy, ten years of age, had suffered from favus for seven years. He was brought up with a brother and sister; and, on the last occasion of the outbreak of the disorder, was one of a school of one hundred and fifty-eight boys. He remained in the school until the disease was fairly developed over the greater part of his head, and was then transferred to the Infirmary, where he was accustomed to play with several invalid companions. Now, during the whole course of his association with other children, although he partook of their games without restraint, although he washed in the same water, and used the same towel and comb, the disease was never communicated to others—it never extended beyond himself.

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[1] Portraits of Diseases of the Skin. Fasciculus I.

Bateman, who was an ultra-contagionist, and gave the specific title of "contagiosum" to a very harmless form of disease of the sebiparous glands—namely, the "small sebaceous tumours" of my classification, opens his history of diseases of the scalp by the observation that "the porrigo is a contagious disease." This sweeping condemnation is immediately followed by an exception in favour of porrigo larvalis; to which might have been added, without any hesitation, porrigo favosa and porrigo decalvans; so that, on the threshold of inquiry into the contagiousness of porrigo, one half the species of that writer might have been declared at once to be free from imputation. The remaining three species, or, as I have shown, two, for porrigo furfurans and porrigo scutulata are stages of the same disease, are, therefore, the only affections about which any doubt can exist in the minds of persons conversant with cutaneous diseases.

The impression made on my mind by the perusal of the account of favus (porrigo lupinosa) which is given by Bateman is, that he cannot have been familiar with the disease, and that his description is not drawn from nature, but composed from the writings of the older medical authors, who, in this instance, had certainly observed the disorder very imperfectly. The term "porrigo" he tells us was adopted by Willan "nearly in the same sense in which it was used by Celsus, who included the moist and ulcerating, as well as the dry and furfuraceous, eruptions of the scalp under this denomination." He further observes, that "numerous writers, ancient and modern, have designated the varieties of the disease (porrigo) by distinct names, such as crusta lactea, alopecia, pityriasis, favi, achores, scabies capitis, &c.; but the most intelligent observers have pointed out the identity of the nature and causes of these eruptions;" from which it may be inferred that the "ancient and modern writers" were greatly superior, in point of discrimination, to the "most intelligent observers;" for, of a surety, nothing can be more widely dissimilar or non-identical than the diseases represented by the six designations mentioned above. In the absence, therefore, of facts, and something in the shape of proof to the contrary, I must be permitted to doubt not only the contagion of favus, but also the qualification of Bateman to speak to the subject. It is further worthy of remark that in the plates of cutaneous diseases published by Willan and Bateman, there is not one which represents favus.

Plumbe commences his treatise on porrigo by adverting to "its known infectious nature." He alludes to favus only as the crusted stage of common ringworm, and that so lightly that it is evident that he cannot have observed the disease with attention. On its contagious property he is obviously no authority.

It appears that favus, which is rare in this country, is common in France. "Next to eczema and impetigo," says Rayer, "favus is the most common of the chronic inflammations of the hairy scalp." Again, he observes, "favus is a contagious disease, and is readily communicated among children who make use of the same comb and brush, especially if any slight excoriation happen to exist on the scalp." He, furthermore, adduces the evidence of Willan, in proof of the contagious qualities of the disease, and concludes with the erroneous observation that "the complaint is very common in England."

Biett records that favus is "evidently contagious, but in some cases the attempt to produce infection has entirely failed." Gibert observes, that the "contagiousness of favus is acknowledged by almost all pathologists;" he then unfortunately adduces the evidence of Bateman, and, after making mention of some instances which prove too much, he finishes up with the following remark :—"The contagiousness of favus is then an established fact." In fairness to him I will now quote his illustrations, however little weight they may have with myself. "In the wards of Biett, two or three instances have been seen of the propagation of this disease by the act of kissing, the disorder making its appearance in these cases around the mouth and on the chin. In a patient who wore a wig which had belonged to a person affected with favus, the latter disease broke out on the arms and legs. This curious circumstance was explained when it was ascertained that the wig always came off during the man's sleep, and was found in the bed in contact either with his arms or legs. Some years since, M. Guersent had occasion to see, in a school, twelve children who were successively attacked with favus within the space of a few weeks or months, in consequence of the admission of a child affected with that disorder."

There is too much of a blind and unthinking deference to the statements of predecessors in all these examples. In some instances, I make no doubt, that the case was not favus at all; and in others, communication by contact has been admitted with too little consideration. The breaking out of a disease in a number of children breathing the same air, partaking of the same food, and living under the same hygienic influence, is a circumstance of daily occurrence, and one totally distinct from contagion; and if, as I have shown, a free association continued for years between an affected individual and others has failed in transmitting the disease, the power of transmission may be reasonably doubted. It is cheering to find an original thinker like Alibert refusing his assent to the current belief in the contagiousness of favus.

Finally, whether we regard favus in its origin, in its development, or in its essential nature, or whether we look at its phenomena in a social point of view, its extreme rarity, and the indisposition to transmission which it evinces when closely observed; in each and every of these features of the disease, we shall find reasonable grounds for doubting its propagation by contagion. My own careful investigations of the subject have forced on my mind the conclusion, that *favus is not contagious.*

700. *Treatment.*—The indications for the treatment of this disease are two in number, the first being, to restore the defective powers of the constitution; the second, to restore the local power of the skin.

The fulfilment of the first indication calls for—improved hygienic conditions, improved diet, tonic alterative medicines; that of the second requires the aid of local remedies belonging to the class of abluents, stimulants. The four great hygienic principles—namely, air, exercise, clothing, and ablution, deserve the first and especial attention in this disease. Favus is usually engendered in the confined and malarious homes of squalid misery, and the most opposite conditions to these should be selected in our treatment; the patients should be sent to a spot located on a dry soil, breathed upon on all sides by a bracing, healthy air, uncontaminated by the steams and impurities which rise from the congregated abodes of human beings. The apartment in which he sleeps should be thoroughly ventilated; it should be large and lofty; he should lie in a separate bed, and the number of persons sleeping in the same room should be as few as possible.

The subjects of this disease are for the most part children, therefore exercise is a paramount necessity. The physical, and not least important, education of children consists in eating, drinking, sleeping, moving, building up a healthy structure, and furnishing that structure with a sound constitution and sound mind. If the physical phenomena of life are well and truly performed, Nature will have no time for pathological actions.

The clothing of children suffering under this disease should be carefully adapted to their own feelings, and to the temperature of the season. It should be kept strictly clean, and frequently changed. Ablution is another important consideration. The sponge bath should be used daily. Local ablution is of little value in comparison with general sponging.

Attention to the diet of persons suffering under favus is of the utmost importance. As a general rule, it should be animal and nutritious, and only moderately fluid. Much vegetable food should be avoided, and all matters which obviously disagree with the stomach. The best directed medical treatment can do but little when the diet is based on a meagre standard.

The medicine which, above all others, is best adapted for favus is *iron*. The formula is not very material. I have used the citrate, acetate, and sesquichloride; and the latter I prefer. The dose which I prescribe for a child of ten years is ten drops of the tinctura ferri sesquichloridi on sugar, three times in the day. The iodide of iron is also a useful remedy. When the powers of the system are much enfeebled, the citrate of iron and quinine is an excellent remedy, well adapted for children from being compounded in the form of a syrup. Where iron produces heat and dryness of the mucous membranes with feverishness, I use the nitro-muriatic acid, either as a sherbet, or combined with tincture of orange-peel or gentian.

If there be any tendency to strumous enlargement of the lymphatic or mesenteric glands, I should recommend the oleum jecoris aselli; and if any tendency to slenderness and flexure of bones, lime water. It is hardly necessary to observe, that the ordinary functions of the body should be watched and regulated by the usual means; but, as a general rule, aperients and purgatives are injurious, and should be avoided.

To restore the local powers of the skin, it is necessary to have recourse to local remedies. In the first place, the crusts must be removed, a manœuvre which is easily accomplished, by impregnating the scalp thoroughly with oil, at bed-time, and washing it in the morning with water and soap. A few repetitions of this process will suffice to clear away the crusts effectually. The same end may be attained by means of a linen compress moistened with a weak solution of subcarbonate of potass, and an oiled silk cap worn for two or three nights; or by a poultice. I am not favourable to the practice of frequent ablution with soap. When the crusts are once removed, a saponaceous ablution is not again required until they re-collect; nor do I approve of shaving the head; the only ground for this practice being cleanliness.

I now come to the means to be adopted to alter and suspend the abnormal actions taking place in the skin, while nature restores by degrees its wonted functions. The agents for effecting this purpose are local stimulants, and the best of these the Ceratum Tiglii, containing from ten to thirty drops of the oil to the ounce; the unguentum hydrargyri nitratis, diluted one-half; the unguentum hydrargyri nitrico-oxydi, diluted in similar proportion; the compound sulphur ointment, or the sulphuret of potash lotion (ʒj ad Oj,) with ceratum camphoræ, half a drachm to the ounce. In chronic cases, where the above remedies may have failed, they might be used in a more concentrated form. I am less favourable to strong applications now than when I began the treatment of cutaneous diseases; but in some instances I have derived benefit from tincture of iodine, and a spirituous solution of bichloride of mercury. Devergie recommends touching the crusts with a solution of nitrate of mercury in nitric acid. Creasote and tar I never use, on account of their powerful odour; and in this disease they possess no especial virtue. The iodide of sulphur I have found to exhibit no superiority over simpler remedies.

An unfounded notion has long prevailed among writers on cutaneous disorders, that the hairs in this disease act as a source of irritation. Some have considered the roots of the hairs to be the seat of origin of the morbid action, and the loosening of the hairs is an idea that has been commonly entertained. Plumbe was a warm advocate for the removal of all loosened hairs by means of the forceps. Rayer observes, "in old standing cases of Favus of the scalp, every method of treatment into which the avulsion or removal of the hair does not enter as an element is incomplete, and unworthy of being entitled curative." "The oldest system of this kind consisted in tearing out the hair violently by means of some adhesive plaster, which was applied or spread over the scalp. To prepare this plaster, it was customary to mix four ounces of rye-flour in a pint of cold white wine vinegar; the mixture was set upon the fire and stirred continually, whilst half an ounce of the deuto-carbonate of copper (verdigrise) in powder was added; it was boiled for an hour, after which four ounces of black pitch, the same quantity of resin, and six ounces of Burgundy pitch were added. When all these ingredients were melted and incorporated, six ounces of antimonial ethiops (an alloy of mercury and antimony obtained by long trituration) in fine powder, were thrown into the mixture, which was stirred till it had acquired what was held to be a proper consistency. The plaster thus prepared was spread upon a stoutish black cloth, which was slit in different directions before being applied, to prevent it from forming any crease, and to admit of its being subsequently removed in stripes.

"The plaster was applied to the head, after having got rid of the incrustations, by softening them with cataplasms, and having clipped off the hair as close to the skin as it could be done with scissors. After the lapse of three or four days, the plaster was removed rapidly the contrary way of the hair; and a second was put on, which was likewise removed in the same manner, three or four days after its application. The plaster was subsequently renewed, every second day, taking care to have the head shaved when this measure appeared necessary. As may be conceived, and as was intended, these plasters, each time they were removed, tore out a quantity of hair, more or less considerable. The first applications were attended with cruel sufferings; the agony became less and less severe as progress was made in the treatment. Nevertheless, the pain was still so great at a month's end, that children might be heard screaming dreadfully when the plaster was removed; after the third month, the pain of the dressing became less intolerable." As a commentary on this barbarous proceeding, the Messrs. Mahon affirm, "that they saw a child die two days after having had this horrible operation performed on its scalp."

The Messrs. Mahon pursue a different process for withdrawing the hair in this disease. They cut it to the length of two inches, apply poultices to soften, and thorough washing with soap to remove the crusts, and then comb the hair repeatedly, in order to draw out all the loosened hairs. After this preparatory process is accomplished, they rub daily into the scalp, for about a fortnight, a moderately stimulating application, consisting chiefly of lime and subcarbonate of potash,[1] in the form of ointment, and continue washing and combing as before. For the next three or four weeks, and until the cure is established, this treatment is pursued with longer intervals, no day being permitted to pass over without a thorough ablution.

It is obvious that this treatment of the Messrs. Mahon, which has proved the most successful ever pursued, does no more than fulfil the local indications laid down at the commencement of the principles of treatment developed in this chapter. These gentlemen call their ointment "depilatory," but in this they fall into the popular error of regarding the hairs, which are really harmless, as irritants. Their system is simply a moderately stimulating plan, wanting, to give it perfection, the constitutional treatment above recommended.

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[1] According to an analysis made by M. Chevallier, the remedies of the MM. Mahon are composed of slaked lime, subcarbonate of potash, and charcoal. They use three applications of different degrees of strength, and once a week they sprinkle a depilatory powder among the hair, which they subsequently comb out.

M. Petel has proposed, as an imitation of MM. Mahon's remedies, an ointment and powder as follows:—

℞
Sodæ subcarb. gr. ix.
Calcis vivi, ʒj.
Axungiæ, ℥ij.
M.

℞
Calcis vivi, ℥ij.
Carbonis ligni, ʒij.
M.

The ointment is to be used daily after washing, and after the removal of the crusts; and the powder is to be sprinkled on the scalp with the view of causing the fall of the hair.

CHAPTER XVII.

SYPHILITIC ERUPTIONS.

703. UNDER the influence of constitutional syphilis, eruptions are developed on the skin, which may assume any one of the elementary forms of inflammation of the derma, and of its glands and follicles, which are characteristic of disease of this tissue. Thus, of the group of congestive inflammations there is not unfrequently met with a syphilitic roseola, syphilitic erythema, and, occasionally, a syphilitic urticaria. Appertaining to the group of effusive inflammations is an eruption of vesicles, constituting vesicular syphilis. Suppurative inflammation of the derma offers several forms of pustular syphilis; papular inflammation of the derma, syphilitic papulæ and tubercles; and squamous inflammation of the derma, syphilitic lepra, and psoriasis. Besides the preceding disorders, which have their especial seat in the tissues of the derma, the sebiparous glands, with their efferent hair-follicles, become the subjects of syphilitic acne, and the hair-follicles of that alteration which gives rise to syphilitic alopecia.

704. Syphilitic cutaneous eruptions are sometimes developed concurrently with the primary signs, but more frequently are of secondary origin, being associated with one or more of those symptoms which are indicative of secondary syphilis, and occurring after the lapse of a variable period of time, frequently of several weeks, and even of months. For the most part they are chronic in their character and progress, but, in some few instances, are attended with symptoms of acute inflammation, particularly when they belong to the congestive group, or are produced simultaneously with the primary syphilitic affection.

Syphilitic cutaneous eruptions are developed most frequently on those parts of the body which are exposed to the influence of the atmosphere, and in which the capillary circulation is consequently most active. Hence we find them often on the face, the forehead, the neck, the wrists, and hands; and, next in frequency, on the trunk of the body and extremities.

705. There are certain signs which distinguish syphilitic eruptions from all others, and may be regarded as pathognomonic; these are, a dulness and coppery hue in the tint of redness, or a lividity in the colour of the patches; a brownish or greenish stain left upon the skin after their decline; an earthy hue of the skin; sometimes a disagreeable odour of the perspiration; and a circularity in the form of the patch. These signs, conjoined with their usual seat on the face and trunk, and especially their association with other symptoms of secondary syphilis, such as ulceration, or thickening of the mucous membrane of the throat, iritis, or periostitis, are sufficient to establish a correct diagnosis of their nature. The crusts which succeed to the pustular forms of syphilis are remarkable for their greenish or blackish hue, their thickness and density. And the scales of the squamous affections are characterized by thinness, and by their dull and grayish tint.

SYPHILITIC URTICARIA.

706. This eruption is a rare form of syphilitic cutaneous disorder, which bears some resemblance to urticaria, but is distinguished from the ordinary forms of that exanthem by the pathognomonic characters of syphilitic disease. Alibert describes syphilitic urticaria under the name of "syphilide pustuleuse ortiée."[1]

SYPHILITIC ROSEOLA.

Maculæ syphiliticæ.

707. Syphilitic roseola is the most common form of congestive syphilitic eruption. It resembles, in general characters, common roseola, makes its appearance under an acute type, but soon passes into the chronic form. This eruption is usually met with in association with gonorrhœa, occasionally it occurs with primary sores, and sometimes with secondary syphilis. It is developed on the limbs and trunk, as well as on the face and forehead, under the form of small, irregular, and rounded spots, of a coppery red colour, which disappear incompletely under pressure with the finger; they are attended with more or less itching, occur usually in considerable numbers, and are sometimes confluent. The spots make their appearance very suddenly, often in the course of a single night; they remain for a few days at their height, and then fade gradually away, being followed by slight desquamation, and leaving behind them a grayish or livid stain, which lasts for several months.

This affection is distinguished from ordinary roseola by the dulness and coppery hue of its patches, by the permanence of the stains which succeed, and by the absence of febrile symptoms. Moreover, the diagnosis is greatly assisted by the presence of gonorrhœa or syphilis, either in the primary or secondary form. There is some danger, at a cursory glance, of mistaking syphilitic spots for ephelis, but a more careful inspection will at once direct us to a correct diagnosis of the two diseases. In ephelis, the patches are irregular in their form, large, disposed to communicate with each other, and occupy chiefly the front of the chest and abdomen. Moreover, they are yellow in colour, attended by considerable itching, and covered by desquamating epiderma. The syphilitic spots, on the contrary, are rounded, small, few in number, and frequently situated solely on the face and forehead. The coppery red or gray colour, again, the lesser degree of itching, and the absence of desquamation, are pathognomonic of syphilitic maculæ.

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[1] This is one of the many instances of the loose application of the term pustular, which have been corrected by Willan and his disciples.

VESICULAR SYPHILIS.

708. *Rupia* is not unfrequently met with as an accompaniment of secondary syphilis, and particularly when the disease has been of long duration, or when the constitution is enfeebled by the abuse of mercury, or by hygienic causes. Other forms of vesicular disease consecutive on syphilis are rare. Gibert remarks that he once saw an instance of pemphigoid syphilitic eruption, and Biett has recorded an excellent case in illustration of syphilitic eczema.

709. The vesicles of cutaneous syphilis sometimes assume the ordinary characters of herpes, at others those of eczema. They appear for the most part in successive eruptions, and are distributed irregularly upon all parts of the surface of the skin, being surrounded by a disk of redness which presents the customary copper-coloured hue of syphilitic cutaneous disease. After the lapse of a few days, the fluid contained in some of the vesicles is absorbed, while others burst, and form a thin and brownish scale, which remains adherent for some time. The spots occupied by the vesicles are marked on their decline by a discoloured stain, resembling that which succeeds to other syphilitic eruptions.

Vesicular syphilis is generally preceded or accompanied by ulceration of the mucous membrane of the fauces and pharynx, and by other symptoms of constitutional disorder.

PUSTULAR SYPHILIS.

710. An eruption of pustules is not an unfrequent form of secondary syphilis. The general characters of this eruption are, its development at a variable period after the primary affection; its association with other indications of syphilitic disease; its appearance under the form of pustules raised upon a hardened base (tubercular pustules;) or surrounded by an inflamed areola (ecthymatous pustules;) and the termination of the eruption either in a discoloured stain, a cicatrix, or an ulcer.

Pustular syphilis presents two principal varieties, the psydracious or tubercular pustule, and the phlyzacious or ecthymatous pustule. But between these varieties there are numerous intermediate degrees, both in respect of the severity of the eruption, and of the modification arising out of the particular state of constitution of the patient.

(A.) *Tubercular Pustules.*

711. Tubercular pustules bear a marked similarity to acne, being developed upon hardened bases, appearing frequently on the face and forehead, and in their mildest form being unaccompanied by surrounding inflammation. They are tardy in their course, present the ordi-

nary colour of syphilitic eruptions, and appear in successive crops; so that, at the same visit, they may be seen at every stage of their progress to maturity. When they burst, the matter which they contain concretes and desiccates into a thin, yellowish-brown, and very adherent crust, which leaves at its fall a discoloured stain, and a small white and circular cicatrix, with a pitted centre.

712. In a more severe form of this tubercular pustule, the base is of larger size and more inflamed, and the pustule, at its apex, contains a greater quantity of pus. The scabs which succeed are consequently of larger size, and of a dark brown and blackish hue.

(B.) *Ecthymatous Pustules.*

713. Instead of the conical and tubercular base of the preceding variety, syphilitic pustules sometimes put on the characters of ecthyma. The pustules are of larger size, they are flattened upon the surface, and sometimes even depressed; they are scarcely raised above the level of the surrounding skin; they contain a variable quantity of a whitish-yellow-pus; they have a hard and inflamed base, are scattered over the surface of the entire body, but are most numerously developed on the face and trunk. On the rupture and desiccation of the pustule, they become covered by a thin, yellowish-brown crust, and leave behind them a small cicatrix in the centre of a livid patch of a coppery hue. Sometimes several of the pustules are confluent; the crust which results is exceedingly thick and adherent, and at its fall is frequently succeeded by an ulcer of considerable extent.

714. The most common form of pustular syphilis (ecthyma syphiliticum) is constituted by pustules, which are larger than those of the preceding variety; they are few in number, and discreet, and in these latter characters approach still more closely in resemblance to ecthyma. They are developed, without pain or inflammation, chiefly on the limbs, and particularly on the lower extremities. They make their appearance, with very trifling pain, in the form of a livid-coloured spot, of about the size of a sixpence. Upon this spot, in the course of a few days, the epiderma is raised, by the effusion beneath it of a dusky purulent fluid, and the pustule is surrounded by a large copper-coloured and purplish areola. When the pustule bursts, its contents desiccate into a hard, round, and blackish crust, bounded by a circular groove. The crust is very closely adherent, remaining for a considerable length of time, and leaving at its fall a deep, circular ulcer, with hard, livid edges, and a grayish unhealthy surface, upon which a second crust speedily forms. The ulcer has no disposition to enlarge, and when it heals, is followed by a round and permanent cicatrix.

It is this form of pustule which is most frequently observed in infants labouring under syphilitic disease. The pustules are large, oval, flat, and superficial; they are more or less numerous, and are followed by blackish crusts, which leave unhealthy ulcerations at their fall.

Syphilitic ecthyma is distinguished from the common form of that pustular affection, by its thick, black, and adherent crusts; the boundary groove which encircles them; the deep and excavated circular ulcers by which they are succeeded; and the depressed cicatrix left by the latter. The bright, purplish-red areola of common ecthyma, again, is widely different from the dull, coppery purple of the syphilitic variety.

PAPULAR AND TUBERCULAR SYPHILIS.

715. The papular eruption (PLATE 5, C.) which sometimes accompanies or succeeds to syphilis, presents the general characters of lichen. It consists of small, hard, slightly prominent, conical pimples, having a coppery hue, and surrounded here and there by a purplish areola. They terminate for the most part by resolution and desquamation; in some few instances the pimples ulcerate at the points, and become covered by thin, brownish scales. The ulcerations are very rarely so extensive as to give rise to the formation of cicatrices. Syphilitic lichen presents itself in an acute and a chronic form.

In the acute form, syphilitic lichen is the occasional concomitant of gonorrhœa, and when it accompanies syphilis, is usually a primary affection. The papulæ are exceedingly numerous, covering the entire body, and appearing almost simultaneously. They terminate, in a few days, in resolution and desquamation, some few of the pimples occasionally ulcerating superficially. Syphilitic lichen is attended with considerable itching, but rarely with symptoms of constitutional disturbance; when these occur, they are limited to some degree of headache and feverishness, and disappear very speedily, generally with the primary symptoms which they accompany.

In the chronic variety of syphilitic lichen, the pimples are as large as the diameter of a small pea; they are flat, but little raised above the surface, indolent, of a coppery hue, but without any areola. They are frequently clustered together in considerable numbers, but are unaccompanied by itching or other symptoms, local or general. They are exceedingly tardy in their progress, commencing in the first instance by small yellowish spots, which gradually rise to the elevation of pimples, and then subside, after an uncertain duration, with equal slowness. When they have attained their complete development, they become surmounted by small thin scales, which are quickly reproduced as frequently as they fall, or are rubbed off. These papulæ are developed chiefly upon the limbs, and sometimes upon the forehead and scalp. They not unfrequently accompany other syphilitic eruptions, particularly the pustular form.

The peculiar coppery hue of syphilitic lichen, and its general distribution over the surface of the body, serve to distinguish it from the non-syphilitic form, which is usually successive in its eruption, and limited to a single region.

SYPHILITIC TUBERCLES.

716. When papulæ assume a large size, they are termed *tubercles;* and this form of syphilitic cutaneous disease is the most frequent of all the affections which accompany the secondary disorder. The syphilitic tubercles present certain points of resemblance in their general characters—viz., their livid and coppery discoloration, their slow

and indolent course, and their occurrence, as a common seat, upon the face, particularly on the forehead and nose; but they also exhibit considerable differences in relation to their size, their number, their form, their arrangement, their progress, and their termination, which constitute so many varieties of the affection.

717. Thus in one variety[1] the tubercles are small, never exceeding the bulk of a pea; they are numerous, disposed in the form of circular rings, flattened, and surmounted by a small, thin scale. Their usual seat is the forehead, the scalp, and neck, and they leave behind them, on their decline, a livid red stain.

When the small tubercles composing these circles are covered with scales, the affection bears some resemblance to a lepra which has healed in the centre. But the distinction between the two diseases is marked by the individuality and thinness of the scales in comparison with those of lepra, their evident connexion with distinct tubercles, and the syphilitic tint which invests the latter.

718. In a second variety the tubercles are larger, arranged in groups, or dispersed without order upon the surface of the skin; they are irregular in their form, smooth and shining in their aspect, unattended by pain, heat, or exfoliation, and rest stationary for years. When partial in their distribution, their common seat is the nose and cheeks.

719. In a third variety the tubercles are large, round, and few in number, indolent, of a violet-red colour, and surrounded by a copper-coloured areola. From time to time, one of the tubercles becomes inflamed and painful, the surrounding skin is congested, and assumes a purplish-red colour, and an ulcer is established upon the summit of the elevation. The ulcer is speedily covered by a thick dark-coloured crust. The ulcer extends deeply; other tubercles and other ulcerations form, and run their separate course, the crusts falling at short intervals, and being replaced by fresh crusts. Sometimes, by the communication of several ulcerations, an irregular ulcer of large size, and covered by a thick greenish-black crust, results. When these ulcers occur on the face, their most frequent seat, a portion of the nose or of the lip may be destroyed by their extension.

720. In a fourth variety, the tubercles being the same in general appearance, the ulcerations which ensue, instead of increasing in depth, extend from the summit of the tubercles to the surrounding skin, in curved lines, which assume a variety of curious figures, being in one place serpentine, and in another forming segments of circles, of greater or smaller diameter. It is this variety which has been described by Alibert as the *syphilide pustuleuse serpigineuse;* the ulceration is superficial, and covered by a thick, blackish crust, and leaves, upon its healing, a white seam-like cicatrix. The whole body is sometimes covered by these ulcerations and their consequent cicatrices.

When these serpiginous ulcerations are concealed by crusts, they have an appearance somewhat resembling psoriasis gyrata; or of lepra in progress of cure, when its circles are broken at one or more points; but the examination of the disease at once removes all similitude. The scales of psoriasis conceal a congested and elevated surface, and not a superficial ulcer. Moreover, the colour of the syphilitic affection is pathognomonic, as are the seams and cicatrices which it leaves behind.

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[1] Gibert terms this affection *tubercules herpetiformes*, from the resemblance which their circles bear to herpes circinnatus.

721. In a fifth variety, the ulceration, instead of spreading to the surrounding skin in the form of a tortuous band, is confined to a narrow line, which crosses the tubercle, and cleaves it into two portions. From this linear ulceration a quantity of offensive secretion is poured out, which concretes into a blackish crust. This form of tubercle occurs upon the face, and not unfrequently upon the scrotum, and around the anus.

This tubercle, in its form and size, somewhat resembles the elevations of lepra guttata, which have lost their scales. But the linear ulceration and the secretion which it pours out are diagnostic of the syphilitic disease. Moreover, lepra guttata is rarely ever seen upon the scrotum, while it is abundantly distributed upon the rest of the body.

Tubercular eruptions are the most troublesome forms of cutaneous syphilitic disease, on account of the tendency which exists to the formation of unhealthy and rebellious ulcerations.

SQUAMOUS SYPHILIS.

722. Syphilitic eruptions occurring at a longer or shorter period after the primary symptoms, sometimes present the character of squamous disease. The scales are thin and grayish in their colour, and are developed on surfaces which are very slightly raised, and of a copper-coloured tint. These affections usually assume the appearance of lepra or psoriasis; they are chronic in their course; and terminate by resolution and desquamation.

SYPHILITIC LEPRA.

723. In syphilitic lepra, which corresponds with the lepra nigricans of Willan, the affected spots are of small size, varying from a few lines to the diameter of a shilling. They are of a dull grayish or blackish hue, darker in the centre than at the circumference, and covered by thin, grayish, brittle, slightly adherent scales. Upon their decline, the elevations look smooth and shining, and they leave behind them, at their disappearance, a livid or gray stain, which endures for a considerable time. The whole skin frequently presents a yellowish, tawny hue, and yields a peculiarly disagreeable odour.

Sometimes the eruption consists of small roundish spots, having the general characters of lepra guttata, but distinguished from the sporadic form of that disease by the purplish and copper-coloured hue of the elevations upon which the thin white scales are developed. Biett considers the presence of a narrow white border of epiderma around each of these spots as pathognomonic of syphilitic psoriasis.

The eruption is developed without pain or itching, or any symptom of constitutional disorder. It lasts usually from six to eight weeks, and sometimes for a longer period.

SYPHILITIC PSORIASIS.

724. Sometimes the patches are of various size, and irregular in their form, presenting the ordinary appearance of psoriasis. They consist of smooth, shining, copper-coloured elevations, very slightly raised above the surface, and covered with thin, whitish, irregular scales. The patches are in some situations isolated and discreet; in others, they communicate, forming patches of considerable extent. The intermediate skin is sallow, and more or less discoloured. This eruption is sometimes limited to a single region of the body, while at other times it is dispersed over the entire surface. Syphilitic psoriasis offers no disposition to the formation of chaps and fissures, as occurs in the sporadic disease.

Occasionally, syphilitic psoriasis appears in the palms of the hands and soles of the feet, but is usually conjoined with the development of the eruption in other parts of the body. In these cases, the palms or soles are covered by a scaly incrustation, consisting of dry and brittle laminæ, which conceal a surface of a violet tint, and somewhat dense in texture, but not elevated above its natural level.

The syphilitic squamous affections are not unfrequently accompanied by pustular eruptions. They are difficult of management, and sometimes exceedingly obstinate under treatment.

725. *Treatment.*—When syphilitic eruptions put on the characters of acute inflammation, they must be treated by antiphlogistic remedies, both generally and locally. Under all circumstances, it is a point of importance to regulate the secretions at the outset of the treatment, and determine what organs are chiefly disordered. Vapour baths are valuable agents in the cure of syphilitic cutaneous eruptions, by relieving cutaneous congestion, and by diffusing over a larger surface the cutaneous determination. For the same reason, sudorifics have obtained considerable reputation, and still continue to be employed as adjuvantia with benefit to the disease, the most approved sudorifics being guaiacum, sarsaparilla, and mezereum.

In cases where, instead of assuming an inflammatory type, the powers of the constitution are reduced below their proper level, it behooves us to have recourse to opiates, in large and repeated doses, in order to subdue the morbid irritability of the nervous system.

When the general indications presented by the particular case before us are fulfilled, we may commence the curative treatment by prescribing some one of the numerous forms of iodine. This medicine is invaluable in secondary syphilis, and is regarded with justice as almost specific in its effects. The formula to which I am disposed to give the preference, is the iodide of potassium, in doses of three grains, three times a-day at first, and increasing them as the symptoms may indicate.

Next to iodine, the bichloride of mercury counts the greatest number of advocates; Biett is strongly in favour of this remedy, which he prescribes according to the following formula:—

℞
Bichloride, gr. xij.
Opium, gr. xx.
M.

Divide into thirty-six pills, and give one every morning, increasing the dose by degrees, and discontinuing the medicine from time to time, in case the bowels may be too much affected. By others, the medicine is preferred in solution, either with or without opium.

Compounds of iodine and mercury are also deserving of trial in obstinate cases of syphilitic eruption. A compound frequently employed on the continent is the proto-ioduret of mercury with guaiacum powder, in the form of pills. M. Gibert has lately directed the attention of the Academy of Medicine to a formula which he terms syrup of ioduretted deuto-ioduret of mercury, (sirop de deuto-iodure-iodurė.) The formula for this syrup is the following:—

℞

Deuto-ioduret of mercury	1 part
Ioduret of potassium	50 parts.
Water	50 "
Dissolve, filter, and add of simple syrup	2400 "

The average dose is from four to six drachms.

M. Gibert speaks very highly of this medicine, which agrees with all kinds of subjects, adults, children, or the aged; healthy or cachectic.

Rayer extols mercurial ointment administered internally for a month or six weeks; he remarks that the absorption of the mercury is more regular and continuous when this remedy is used than when any other mercurial is employed. Whenever any affection of the gums is apparent, he diminishes the dose, or stops it for awhile, to resume as soon as the effect has passed away. The formula approved by Rayer is that of Sedillot,—namely,

℞
Ung. mercurial. fort. ℥ij.
Sapon. Castiliensis, ℈ij.
Pulv. et mucilag. altheæ, q. s.
M.

Make into thirty-six pills; two or three to be taken daily. It is highly probable that the oleaginous solution of mercury conveyed in this combination may offer a superiority in absorption to other compounds.

Whatever the remedy may be that is selected, its action may be increased by the administration, at the same time, of one of the sudorific decoctions above recommended.

The *local* applications hold in the first rank, emollient baths: these are useful in all varieties of the disease, but especially in the squamous affections, in which they should be rendered alkaline.

Papulæ and tubercles may be stimulated to absorption by means of an ointment of ioduret of mercury, or ioduret of sulphur; or if they be situated around the anus, or upon the scrotum, by fumigations of cinnabar.

For ulcerations and abrasions of the surface, a weak nitric acid lotion, with or without opium, is the best application; or to relieve pain, the hydrocyanic acid lotion.

For the squamous affections, I have found the blue pill in small doses taken twice a-day, and until the gums are slightly tender, a specific remedy.

CHAPTER XVIII.

HISTORY AND DESCRIPTION OF THE ITCH-ANIMALCULE.

ACARUS SCABIEI.

727. A POPULAR knowledge of the existence of the itch-animalcule is probably coeval with the first development of scabies in the human race, since we find that the earliest writers mention it as possessing a popular synonym. Our dictionaries afford us similar information, and most observers have noticed the fact that a living creature is commonly extracted from the bodies of those affected, by members of their own class, and by fellow-sufferers.

728. The earliest scientific information relative to the itch-animalcules that we find recorded, dates as far back as the time of Aristotle, 350 years before the Christian era. For we are informed by Moufet, in the commencement of his chapter, "De syronibus, acaris, tineisque animalium," that ARISTOTLE was acquainted with these syrones—a statement which he precedes by a reproof to Thomas a Veiga for making an assertion to the contrary. For, says he, "Syronem antiquitate ignotum fuisse Tho. a Veiga falsò memorat, nam ipsum ακαριδιον Aristoteles vocat." (5 Histor. Animal., cap. 32.)

729. That the itch-animalcule was well known to the GREEKS may also be inferred from the names *siro* and *acarus* by which it is designated, for, according to Moufet, both of these terms are derived from the Greek language. "Syrones item dici videntur, απο του συρδην ερπην, quia *tractim sub cute repunt.*" And again, he observes, "το γαρ ακαρες, teste Polluce et Sinda, exiguum illum dicitur, quod ab exiguitate non possumus κειραι, id est, dividere."

730. The ARABIANS were also acquainted with the animalcule at a very early period, for we find ABINZOAR, in the twelfth century, thus speaking of them: "Syrones *Assoalat* et *Assoab* dicti, sunt pedicelli subter manuum crurumque et pedum cutem serpentes et pustulas ibidem excitantes aquâ plenas: tam parva animalcula, ut vix visu perspicaci discerni valeant."[1] But Moufet expressly tells us that Abinzoar is the only one amongst the ancient authors who shows any knowledge of scabies and of the proper method of treating it, "Horum nullus antiquorum meminit præter Abinzoar qui morbum hunc vidit et curationem ejus recte instituit."

731. By the ROMANS the itch-animalcule was named *pedicellus;* and from several quotations made by Moufet, we may learn that the Roman physicians were well acquainted with it.

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[1] Moufet, Theatrum Insectorum, p. 266.

Scaliger, in his letter to Cardanus in 1557, remarks that the acarus is globular in form, and so minute as to be scarcely perceptible. The Turinians, he observes, called it *scirro*, and the Gascons, *brigant*. The little creature lives in canals which it burrows in the epiderma, and when taken out and placed upon the nail, exhibits a certain degree of movement, which is much increased by the warmth of the sun. When crushed between the nails, a slight noise is heard, and a small quantity of watery fluid is perceived.[1]

Gabucinus observes, "Ad nostra tempora quoddam supplicii genus indomita fœditate pervenit; in manibus exilis quidam pedicellus, lente minor, sub cute serpit."

Ingrassias, after referring to the statement of Abinzoar, observes, "Excoriata cute ubi minimus ille jonthus varulusve, cujusdam sudaminis instar apparet, exeunt animalcula viva, tam parvuncula ut vix possint videri."

Jobertus very aptly compares them with moles, but unfortunately invalidates his testimony by supposing them to be the hidden cause of porrigo, for, says he, "nascuntur sæpe in capite et pilorum radices exedunt, quos Græci τριχοβρωτους, τριχοσρωκτας, σητας, τριχοβορους, tineas peculiari nomine appellant."

Aldrovandus, also, in 1596, draws attention to the minute size of the *pedicello*, its resort in burrows beneath the epiderma, and its excitation of vesicles. He remarks that we need sharp eyes and a good light in order to perceive it.

732. **Moufet**, in the famous work already referred to, the "Theatrum Insectorum," which was published in 1634, by Sir Theodore Mayerne, after the death of its author, but was commenced during the preceding century by Wotton, Gessner, and Penn, gives the first account of the itch-animalcule published by an English writer. In this volume we find recorded a very complete description of the creature, and the most important facts with regard to its habits are accurately noted. In truth, but little is known on this subject, even at the present day, that was not already pointed out by this distinguished writer. In reference to their size and form, he observes, "Syronibus nulla expressa forma (ut recte Scaliger notavit) preterquam globi: vix oculis capitur magnitudo tam pusilla, ut non atomis constare ipsum, sed unum esse ex atomis Epicurus dixerit." In another place he remarks, "Animalculum est omnium minutissimum;" its colour, "est albicante, capite excepto; proprius intuenti nigricat, vel nigro parum rubet;" and it moves briskly when liberated from confinement, and stimulated by light and warmth. "Extractus acu et super ungue positus, movet se, si solis etiam calore adjuvetur." He remarks upon the burrowing habits of the creature, and upon the situation in which it is usually found, "Ita sub cute habitat, ut *actis cuniculis* pruritum maximum loco ingeneret;" and again, "Mirum est quomodo tam pusilla bestiola nullis quasi pedibus incedens, tam longos sub cuticulâ sulcos peragat. Hoc obiter est observandum, syrones istos non in ipsis pustulis sed prope habitare." He, moreover, rebuts the notion of their being allied

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[1] Exercitatio 194; de Subtilibus; num. 7, 1557.

to pediculi, and defends Aristotle against such an insinuation. "Neque syrones isti sunt de pediculorum genere ut Johannes Langius ex Aristotele videtur asserere: nam illi extra cutem vivunt, hi vero non: neque revera Aristoteles ullo quod sciam scripto inter pediculos acaros numeravit." His inference respecting their origin, drawn from their habitation, savours rather of the times than of the truth. "Illorum quippe proprium est non longe residere ab humore aqueo in vesiculâ vel pustulâ collecto: quo absumpto, vel exsiccato, brevi omnes intereunt. Unde colligimus, quemadmodum ex sero putrefacto exoriantur, sic eodem vicissim sustentantur." Moufet falls into the pardonable error, since repeated by several modern authors, especially by Linnæus, of confounding the acarus scabiei with the acarus domesticus. Thus, he remarks that the syrones are produced in decayed cheese and wax, and when found in these substances, as well as in leaves and dried wood, they are termed *mites*, "sed in homine *wheale wormes* dicuntur, et Germanice *Seuren*."

733. In the year 1654, AUGUSTUS HAUPTMANN, a German physician, published a work on baths,[1] in which he speaks of the Acari or Sirones which he found in persons affected with scabies. These, he says, are in German called "Reitliesen;" they have six legs, and in appearance they resemble the mites of old cheese. To Hauptmann belongs the credit of giving the first figure of the animalcule; which is referred to by Bonanni, both in his own work and in his edition of Kircherius, in the following terms: "Monstrosam eorum figuram cum permultis et oblongis post tergum caudis depinget."

HAFFENREFFER, in 1660, also a German physician, alludes to the acarus as a species of pediculus of very minute size, breeding between the epiderma and the derma.[2]

734. In 1682, a short notice of the animalcule, attributed to ETMULLER, is given in the first volume of the "Acta Eruditorum Lipsiæ."[3] In this account reference is made to Scaliger's observation of its globular form, and to the opinion entertained by Rohault[4] of its back being covered with scales: "Dorsum sit squammosum seu squamis coopertum." The author gives the following description of them: "Colore sunt albicante et pedibus exceptis, qui proprius intuenti nigricare videntur, pedibus sex instructi sunt, binis utrinque mox juxta caput positis, quibus talparum ritu canaliculos sub cuticulâ agere, ut oblongos non raro, quasi sulcos, trahere, simulque molestissimum pruritum excitare videntur." The paper is illustrated with three figures, drawn with an object-glass of low power; they are somewhat coarsely executed, but afford a tolerably fair representation of the general characters of the animalcule.

735. During the following year—namely, in 1683, Giovanni Cosimo Bonomo published his letter to Redi,[5] which was translated into Latin by Lanzoni,[6] in 1692. An abstract of this letter was read before the

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[1] Uhralten Wolkensteinischen Warmen Bad und Wasser schatze, 8vo. Dresden.

[2] Nosodochium cutis affectûs. Ulmæ, 1660.

[3] For September, 1682, p. 317.

[4] Trac. Physic., par. i., cap. 21, 1798.

[5] Observazioni intorno a pelicelli del corpo umano del. G. Cos. Bonomo, in una lettera al Fr. Redi.

[6] Observationes circa humani Corporis Teredinem. In Miscell. Natur. Curios. for 1692.

Royal Society by Dr. Mead, and published in the Philosophical Transactions[1] for 1702. Bonomo gives a more perfect account of the acarus scabiei than had hitherto existed. His attention was first drawn to the subject by meeting with the popular name of the itch-animalcule in his *Vocabulario dell' Academia della Crusca*, followed by the accompanying explanation:—"*Pellicello e un piccolissimo Bacolino, il quale si genera a Rognosi in pelle e rodendo cagiona un' acutissimo pizzicore.*" He then betook himself to researches with the view of determining the truth of this definition, in which he was aided by his friend Hyacintho Cestonio, who informed him that he had seen "mulierculas propriis e scabiosis filiolis acûs extremitate, nescio quid educere, quod in læve manûs pollicis ungue, alterius manûs pollicis ungue compressum, in ipsa compressione aliquem parvum sonum facere videtur, hoc autem educi a minutioribus tuberculis scabiosis, perfecta nondum sanie scatentibus, vel ut vocitant immaturis; mutua quod itidem charitate inter remiges et mancipia Balnei Liburnensis, si scabies infestaret fieri, adnotavit." Having obtained one of the animalcules, Bonomo examined it with the microscope, and "found it to be a very minute living creature, in shape resembling a tortoise, of a whitish colour, a little dark upon the back, with some thin and long hairs, of nimble motion, with six feet, a sharp head, with two little horns at the end of the snout."[2]

Bonomo gives two rude figures of the animalcule, which are inferior to those in the "Acta Eruditorum," and must have been observed with a bad microscope. He also delineates its "very small and scarcely visible white egg," and stands alone in this observation. Two remarks in Bonomo's letter are especially deserving of attention; the first is, his comparison of the *siro* with a little bladder of water; and the second, his observation relative to their habitation in vesicles, "immaturis;" both of which are invaluable as aids in seeking for the animalcule.

736. MORGAGNI, in his 55th Letter, book 4, contributes his evidence to the existence of the itch-animalcule and records a case in which he saw the creature himself.

737. In 1691, PHILIP BONANNI, in his "Observationes circa viventia quæ in rebus non viventibus reperiuntur," as well as in his edition of the "Rerum Naturalium" of Kircherius, refers to the opinions of Bochartus, Kircherius, and Borellus. KIRCHERIUS found these minute creatures, "candidi puncti similitudinem," when examined with the microscope, to be "animalia pilosa et prorsus urso similia." BORELLUS, he observes, "histrici similia facit;" but this author, I am inclined to think, describes the acarus domesticus, and not the acarus scabiei; although he was evidently acquainted with the latter, since, in his "Historiarum et Observationum Medico Physicarum," under the title of "Ulcera Pediculosa,"[3] he records an instance of vesicular affection apparently identical with scabies. Bonanni gives four figures of the animalcule, one from Bonomo's letter, two from the Acta Eruditorum, and one of his own. Concerning the latter he observes, "insectum

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[1] Philosophical Transactions, vol. xxiii., p. 1296, pl. 283.

[2] Philosophical Transactions, abridged, vol. v. p. 199.

[3] Obs. 20.

hexapode, quod motu erat pigrum, colore livido, et raris setosis villosum."[1] In size, it was about equal to a grain of sand; and he concludes his description with the following question:—"Unde nam istos animatorum semiatomos erupisse judicabimus?" From the examination of his figure, which is of large size, and exceedingly rude, and from his statement that four of the little animals were sent to him by Baldigianus, a professor of mathematics in Rome, and who had extracted them from the face of one of his scholars, it is quite evident that they are pediculi pubis, and not acari. Bonanni recopies the four figures from Kircherius.[2]

738. In 1744,[3] **Baker**, in a curious work, entitled the "Microscope made easy," for the perusal of a copy of which I am indebted to my kind friend Dr. Grant, remarks—"The microscope has discovered what, without it, could scarcely have been imagined, that the distemper we call the itch is owing to little insects under the cuticula, whose continual bitings cause an oozing of serum from the cutis, and produce those pustules and watery bladders whereby this disease is known." He then quotes the description of the animalcule, and the mode of finding and extracting it, given by Bonomo, and copies the two figures of this author, not forgetting the ovum.

739. In 1762, **Casal**, a Spanish physician, in a work, entitled "Medical Researches on the Asturias," referring to the burrowing and grubbing habits of the acari, remarks, "Vocantur aratores, et merito, arant enim semper inter cuticulam et cutem."

740. In 1786, **Dr. Wichmann**, of Hanover, was induced to verify the prevailing opinion of the existence of an animalcule in connexion with scabies, and the results of his labours are published in a volume entitled "*Ætiologie der Kraetze.*"[4] He found the zoological characters of the animalcule undecided, and the precise species infesting the skin in scabies undetermined. "Thus," he remarks, "of many naturalists, to name only a few of rank, Linnæus has only *tentacula*, Schæffer has *antennæ pediformes articulatæ*, while Baron de Geer expressly says, they have no antennæ, but two arms with joints, which resemble those of spiders, who have likewise no antennæ." He alludes also to the opinion of Linnæus, that the acari farinæ might be conveyed, in the powder used in dressing children, to their skins, and there colonized; and he attributes to this error on the part of the great naturalist the assertion made by Professor Murray,[5] "that previous to any appearance of pustules, (in scabies,) there is always a foulness of the juices, and that when this foulness has got a certain height, the acari of cheese or meal are induced to seek a nidus in the skin." Dr. Wichmann refers also to the omission of distinction of species by Pallas,[6] for that author remarks, "Acarus scabiei, acaro farinæ est consanguineus." De Geer, however, distinguishes the two species very accurately, for of the acarus farinæ he observes, "Acarus oblongus albus, capite rufescente, pedibus conicis crassioribus æqualibus;" and of the acarus scabiei, "Acarus subrotundus albus, pedibus

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[1] Fig. 114. [2] Fig. 95. [3] This is the date of the third edition.

[4] 8vo. 1786; and London Medical Journal, vol. ix. 1788, p. 28.

[5] De vermibus in Leprâ obviis. Göttingen, 1769, p. 9.

[6] Dissertatio de infestis viventibus, 1760, p. 2.

rufescentibus brevibus; posticis quatuor seta longissima, plantis quatuor anticis fistulatis capitulo terminatis." The author points out the vesicles as the seat of habitation of the animalcule, but he observes, that "even before such a transparent vesicle is formed, we may often discover traces of the insect on the fingers or hands, in a reddish streak or furrow," and "it is even more usual to find it in these furrows than in the pustules themselves." The furrows he finds only on the hands and fingers. Dr. Wichmann gives two figures of it, as examined with an object-glass of high power. These are very correct, and give a better idea of the little creature, as seen by that instrument, than any other delineations published. Like his predecessors, he makes no attempt to describe the zoological characters and structure of the animalcule.

741. In 1805, Dr. Adams gives two excellent figures of the itch-animalcule in a paper[1] addressed to Sir Joseph Banks, and read before the Royal Society in the month of April of that year. This paper is entitled "*An account of the Acarus Siro* (*Acarus Exulcerans of Linnæus,*) *by some considered as the Itch Insect.*" The figures of the acarus which accompany this paper are superior to any that have been published either before or since, and are sufficient to identify the animalcule completely with the acarus scabiei. The author's observations were made in Madeira, where, it would appear, the creature is extremely common, and is called *oçao*, *ouçou ouçam*. Dr. Adams gives no zoological description of the animalcule, but confines himself chiefly to the disease engendered by its presence, and to the mode of detecting the oçao. In the latter art he was instructed by an old woman, and he confesses himself to have been a dull scholar; but the results of his researches afford no better information than that which I have already adverted to, as contained in the Theatrum Insectorum of Moufet. The principal seat of the animal, says Dr. Adams, is a "reddish elevation" at the end of a "somewhat knotty" reddish line, extending from the vesicles for the distance of about a quarter of an inch. The author attributes to the animalcule a "power of leaping with a force not less than a flea. Such was the case with one whilst I was examining it under a convex lens." In this he is entirely mistaken; for the creature is deficient in the organization necessary for such an effort, and its sudden disappearance from the field of his lens is rather to be ascribed to some untoward movement occurring during the adjustment of his optical apparatus. Dr. Adams expresses himself unwilling to accord to Bonomo all the credit which that writer claims; and in reference to the discovery of the egg, he remarks—"Without suspecting the good intention of this writer, you will readily admit the uncertain discrimination of the egg of an insect, described by De Geer as about the size of a nit, but which, on placing it under a microscope, by the side of a nit, did not appear more than a fourth part of its bulk. For myself, I never could discover what could satisfactorily be called an egg."

Hitherto Dr. Adams has spoken of the oçao as being identical with the itch-animalcule of Bonomo and other writers, but in subsequent paragraphs he declares his belief that the disease engendered by the ouçoes and that of the itch are perfectly distinct, and he founds this opinion upon the following data:—

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[1] Published in his work on Morbid Poisons, 4to. 1807, p. 293.

1. The disease of ouçoes is attended with considerable febrile disturbance, and sometimes with severe local symptoms.

2. It is easily cured; by extracting the animalcules, by the white precipitate ointment, or by the use of sulphur internally.

3. It is liable to recur, from the development of undestroyed ova, unless the remedies be continued for a month after the apparent cure; and even then, if the disease be cured in the autumn, it is liable to return in the spring, because the animalcules remain torpid during the winter.

4. It is always attended with vesicles which possess great uniformity, and have each a red line; whereas in itch the vesicles are variable in size.

5. The natives of Madeira entertain a disgust for the itch, which they call *sarna;* whereas the ouçoes give them no discomfort.

6. The dictionaries of all languages are opposed to the similarity of the affections, since they indicate a name for the animalcule distinct from that of the itch.

7. John Hunter could never discover the itch-animalcule.

Now all these objections, cogent as they may have appeared to the author, must instantly fall to the ground the moment that the animalcule is shown to be present in the itch, and to be the real cause of that affection. Nor would it be difficult to prove, seriatim, that each of the objections above cited is equally unfounded. The figures appended to Dr. Adams' paper are so excellent, that I am inclined to assign to them a rank superior to those of Wichmann, although the object of the two authors is widely different, and scarcely admits of comparison, for while the figures of Adams are intended to trace form and general character, in those of Wichmann there is a manifest endeavour to exhibit texture.

742. The year 1812 witnessed the performance of a most remarkable scene in the memoirs of the acarus scabiei. M. GALES, Pharmacien of Saint Louis, tempted by a prize offered by an unbeliever in the existence of the little animal, introduced the gentle stranger to the wondering gaze of the *notabilities* of Paris. The Academy applauded, the crowns were paid, and the pencil of the artist of the Musée Royale was called to perpetuate the juggle. He drew to the life the common meal-mite! (acarus farinæ.) It is needless to say, that the statements put forth by M. Galés were, from beginning to end, a tissue of deceptions, and to have written such stuff as that contained in his paper is the best proof that he could never have seen the animalcule. M. Patrix played pantaloon to M. Galés's clown.

743. The discovery of the treachery of M. Galés was not, however, made for a considerable number of years, when, with some difficulty, Raspail succeeded in proving the identity of the insect of Galés with the acarus farinæ. The consequence of the exposure was universal distrust, and in this state the question remained, until a young student from Corsica, M. RENUCCI, in the year 1834, exhibited the veritable

animalcule in the clinical theatre of Alibert, and demonstrated the method of discovering its lurking place in the epiderma.[1]

744. The subject was next taken up by M. ALBIN GRAS, a student of St. Louis, who has shown himself well qualified for the undertaking. He published a small treatise[2] in the autumn of 1834, in which he gives a good summary of the knowledge of our ancestors relative to the animalcule, explains the manners and habits of the little creature, and details some excellent experiments made by himself, in reference to the mode of treatment of the disease. The habits of the acarus, when placed upon the skin, are detailed in § 481 of this volume, and M. Gras' experiments on the influence of medicinal agents on its vitality are quoted in paragraph 483. After giving a description of the animalcule inferior to that of M. Raspail, the author remarks, "If we observe the mode of progression of the insect on the epiderma, we may easily assure ourselves that it does not bore its cuniculi, in the manner of the mole, by means of its anterior legs,—for the legs are not disposed to enable the creature to effect its object in this manner,—but it lifts the epiderma by means of its flattened snout. The hairs upon its back aid it in this operation, for being directed posteriorly, all return on the part of the animal is rendered impossible."

"In examining several sarcoptes beneath the microscope, we frequently perceive them to lay several small, white, oblong, and transparent eggs, the eggs, according to M. Duges, being one-third the length of the animal." "If we place an acarus on the epiderma, we perceive it to dodge about here and there, following by choice the course of the folds of the skin, and every now and then fixing itself upon the epiderma, and raising the posterior part of its body."

745. In 1834, RASPAIL published his "Mémoire comparatif sur l'histoire naturelle de l'insecte de la Gale," in which he details the history of modern discovery in France relative to the itch-animalcule—a narrative replete with misadventures, that the perusal of Moufet would have effectually prevented. In 1831, he had seen and delineated the acari scabiei of the horse, but it was not until three years afterwards that he was first shown by Renucci the animalcule of the scabies of man. After describing the epidermal cuniculi which are burrowed by the creature, he observes that the precise seat of the acarus is indicated by a *white* point. His description of the animalcule is the following. It is white, scarcely half a millimetre in diameter, head and feet reddish and transparent, and it is invested by a covering which is hard, dense, and resisting. Its *abdomen* is flat and smooth; the *dorsum* presents three prominences, one, of very large size, in the middle, one, next in size, over the abdomen, and one near the head. Along the *lateral border* of the creature, the dorsal and ventral surface join like the carapax and plastrum of a tortoise, and the resemblance to the shell of this animal is increased by

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[1] Some account of M. Renucci's mode of procedure will be found in the Gazette des Hopitaux, and Gazette Medicale for 1834.

[2] Recherches sur l'Acarus ou Sarcopte de la Gale de l'homme. Par Albin Gras. Paris, Octobre 11, 1834.

the projection of the head and anterior legs from the space between the carapax and plastrum in front, between which they appear capable of retraction. The *head* is provided with two large eyes, placed laterally; it is surmounted by four antennæ, which are disposed in two rows, between the eyes; the trunk is folded beneath the head. The *anterior legs* have four joints, and a haunch-piece at the base of each; they are terminated by a stiff ambulacrum, furnished at its extremity with a sucker. The *posterior legs* have the same number of pieces as the anterior, but are not more than one-fourth their length, and scarcely project beyond the abdomen. Each leg is terminated by a long hair in place of an ambulacrum. The *anus* projects, more or less, from the posterior border of the carapax, and is bounded by two short parallel hairs on each side. The carapax and plastrum are horny in texture; the former is surmounted by stiff horny hairs, disposed in a certain order, two rows passing backwards from the centre to each side of the anus, and two forwards to each side of the head. The structure of the carapax is reticular, the meshes extending transversely.

The figures accompanying this excellent description of the animal do great injustice to the text; they are greatly inferior to those of Adams, and also to those of Wichmann, neither of which appear to have been known to the author; while he praises very highly the figures of De Geer, which are inferior to both.

746. Besides the authors referred to, some account of the acarus scabiei will be found in *Schenkius*, Obs. 676; in *Rosenstein*, on the diseases of children; *Pallas*, de infestis viventibus, 1760; *Sauvages*, Maladies de la Peau; *Miscellanea Curiosa*, 1692; *Annales des Sciences d'Observation*, vol. ii. p. 446, vol. iii. p. 298, 1880; *Lancet Française* Août, 1831; *Bulletin de Therapeutique*, vol. vii.; *Journal des Connaissances Medicales*, Septembre 15, 1834. And for the comparative history of the animalcule, *Walz*, de la Gale de Mouton.

747. LINNÆUS, from an imperfect acquaintance with the acarus scabiei, has been the cause of much of the confusion and obscurity which have involved the history of this animalcule. He places *acarus* in his order *aptera*, and gives the following as the characters of the genus:[1]—

Os proboscide carens, haustello vaginâ bivalvi, cylindricâ, palpis duobus compressis, æqualibus, haustelli longitudine.

Oculi duo ad latera capitis.

Pedes octo.

Tentacula duo, articulata, pediformia.[2]

In the first edition of the Fauna Suecica,[3] Linnæus describes the animalcule under the specific designation of "*acarus humanus subcutaneus.*" In the second edition[4] he considers the acarus humanus subcutaneus as belonging to the same species with the flour-mite, cheese mite, &c.; and in the "Systema Naturæ" observes, "Inter sirones Farinæ, Scabiei, Phthiseos, Hemitritæi, vix etiamnum, repereri alias differentias quam a loco petitas;" while he admits the itch-animalcule as a new species, under the name of "*acarus exulcerans.*" The specific characters of these two species he thus indicates:[1]—

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[1] Systema Naturæ, 1767.

[2] Entomologia Faunæ Suecicæ. Villers' Edition, 1789.

[3] No. 1194.

[4] Anno 1761. No. 1979.

Acarus siro.—A. lateribus sublobatis, pedibus quatuor posticis longissimus, femoribus capiteque ferrugineis; abdomine setoso.

β. A. humanus subcutaneus.

"Habitat sub cute hominis scabiem caussans ubi vesiculam excitavit, parum recedit corporis rugis secutis, quiescit iterum et tittilationem excitat; nudis oculis sub cuticulâ delitescens observatur ab adsueto acu facile eximitur, ungui impositus vix movetur, si vero oris calido halitu affletur agilis in ungue cursitat.

"*Descriptio.*—Minimus, magnitudine vix lendis subrotundus, capite vix conspicuo, ore ut et pedibus ruffis sive testaceis; abdomen ovatum hyalinum; in dorso duplici linea lunari seu pari linearum fuscarum recurvatarum notatum et quasi lobo utrinque.

"*Acarus exulcerans.*—A. pedibus longissimis setaceis; anticis duobus brevibus.

"Habitat in scabie ferinâ, cujus caussa est."

In the "Entomologia Faunæ Suecicæ" of Linnæus, edited by Villers,[2] the editor retains the above "*Descriptio*" in connexion with acarus siro, but the "Habitat" he transfers to acarus exulcerans, commencing it thus—"Habitat in scabie ferinâ, sub cute hominis," &c. To this he adds the observation of Fabricius—"Acaro sirone minor et distinctus et forte acaro exulcerante non diversus." Then follows the "'Descriptio.' A. albus, diaphanus; corpos rotundatum, scabrum, nigro non lineatum uti acarus siro." The editor concludes with two remarks from his own pen:—"Obs. 1. In Fauna Suecica, ed. 1, acarum farinæ et scabiei seperaverat Linnæus, postea conjunxit, sed DD. Geoff., Fab., De Geer, pro diversis speciebus rité habuerunt; ergo veré distincti.—Obs. 2. Scabiei certe hic acarus caussa est."

In the 13th edition[3] of the "Systema Naturæ," the acarus siro, comprising the meal-mite, the cheese-mite, &c., is separated from acarus scabiei, but the acarus exulcerans is still retained. The specific characters of the acarus scabiei are thus stated:—

"*Acarus scabiei.*—A. albus, pedibus rufescentibus; posterioribus quatuor seta longissima.

"*Habitat* in ulceribus scabiosorum, cutis rugas sequendo penetrans, titillationem excitans; utrum causa, an potius, symptoma mali? Sirone multo minor."

Of the acarus exulcerans, Linnæus remarks—

"Habitat in ulceribus scabie ferinâ laborantium. An satis distinctus ab A. scabiei?"

In the "Amœnitates Academicæ"[4] the following passages, which are deserving of notice, occur. The first conveys the best idea of the seat and appearance beneath the cuticle of the acarus that I have met with in any writer; and the latter puts forth the unfortunate observation, which led Linnæus so deeply into error with regard to the classification of the itch-animalcule. Speaking of the vesicles, the writer observes—"Parum vero ab illa in ruga cutis punctum quoddam fuscum quod nondum in vesiculam se extulit, fit tamen duobus diebus progressis; acûs aculeo lens minima eximitur, quæ ungui imposita et halitu oris afflata, in ungue cursitat. Oculis armatis ulterius appareat insectum hoc octo habere pedes, setas quasdam in dorso et acarum esse jam allatum." "Si mater aut nutrix infantem farina cereali, in qua acari sæpissime habitant, adsperserit, infans in ea parte primo et toto tandem corpore scabie laboravit."

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[1] Fauna Suecica. Editio altera, auctior, 1761, Nos. 1975, 1976.

[2] Anno 1789.

[3] Edited by Gmelin, anno 1788. Vol. 5.

[4] Miracula Insectorum. By G. E. Avelin. Upsal, 1752. Amœnitat. Acad., vol. iii. p. 333.

In Sweden, Linnæus remarks that the itch-animalcule is named *Klamask*.

Schaeffer also describes the animalcule in his "Elementa Entomologiæ," in 1766.

748. **Baron De Geer** was thoroughly well acquainted with the itch-animalcule, and has left an admirable description[1] of the creature, as well as two excellent figures. The latter, however, are not equal to the description. He points out the error of Linnæus with regard to classification, and expresses his conviction of the identity of the acarus scabiei and exulcerans. The specific characters of the acarus scabiei he describes as follows:—

"Acarus subrotundus albus, pedibus rufescentibus brevibus; posticis quatuor seta longissima, plantis quatuor anticis fistulatis capitulo terminatis."

The capitulum in this definition he speaks of as being "en forme de vessie;" and in reference to scabies he observes—"Ces mittes sont même l'unique cause de cette vilaine maladie."

749. **Fabricius**,[2] in his "Systema Entomologicæ," places the acarus in the order *antliata*, which he characterizes as possessing "os, haustello, sine proboscide." The characters of the genus he thus designates:—

"*Acarus.*—Haustellum, vagina bivalvi, cylindrica; palpi duo longitudine haustelli." To which, in the amended edition of 1794, he adds —"antennæ filiformes."

With regard to specific characters, Fabricius adopts the definitions of Linnæus, and admits two species as inhabiting the skin of man—namely, the acarus siro and the acarus exulcerans. Of the former he remarks:—

"Habitat in caseo, farinâ diutius asservatis, cutem hominis rugas secutus penetrat, vesiculam et titillationem excitat. Caussam, nec symptoma morbi esse evincunt observata analogia cum Gallis contagium cura."

And of the latter:—

"Habitat in scabie farinâ."

In the "Fauna Grœnlandica,"[3] the same author observes, with regard to the acarus siro:—

"Habitat in vesiculâ scabiei Grœnlandorum, qui illum acu apte eximere scientes, mihi miranti, ut vivum animal incedentem ostenderunt. En Grœnlandos Entomologos." "Varietatem farinæ quidem etiam in farina mea vidi: an vero in Grœnlandia domi habeat, incertus sum dum Grœnlandi farinaceis non utuntur." He remarks also, that in Greenland the animalcule is named "*Okok;*" and that in the natural history of Bomares it is termed "*Scab-orm.*"

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[1] Mémoire pour servir à l'histoire des insectes. Vol. vii. 1778, p. 94, pl. 5, figs. 12—14.

[2] Johannes Christ. Fabricius. Ed. 1775, p. 81.

[3] Anno 1780, p. 221.

In the "Entomologia Systemica, emendata,"[1] Fabricius adopts the opinion of De Geer with regard to the identity of the acarus siro with the acarus domesticus, or cheese and meal mite, and admits the itch-animalcule as a distinct species, with the following characters:—

"*Acarus scabiei.*—Albus, pedibus rufescentibus, posticis quatuor longissima."

"It is," he continues, "multo minor et distinctus ab acaro sirone." He observes also that this species corresponds with the acarus exulcerans, and quotes a passage from Linnæus to the same effect.

750. MULLER, in his "Prodromus Zoologiæ Danicæ,"[2] adopts the early classification of Linnæus, considering the itch animalcule under the designation of acarus siro. In Denmark, he observes, the creature is called *Krid-orm*, *Ring-orm*, and *Meel-mid.* The latter term, which, translated, would be *meal-mite*, indicates the popular extension, or possibly the popular origin, of the error of the great Swedish naturalist.

751. LATREILLE established the itch-animalcule as a new genus under the name of *Sarcoptes hominis*, with the following description:—Body apterous; no distinction of head or segments; manducating organ prominent, without apparent palpi; eight short legs. Subsequently, however, on the occasion of the memorable juggle of Galés, Latreille omitted the genus altogether.

752. The existence of the acarus scabiei is without question: I have extracted as many as twenty from their seat at a single sitting. I have placed them on a slide of glass, and seen them run; and after the business of the day has been over, I have examined them with the microscope, and found them still active, living for several hours after my examination. I have already stated that I regard them as the unique cause of scabies, and as a necessary feature in the diagnosis of that disease.

When examined with the naked eye, the acarus looks white and shining, globular in its form, and very aptly resembling the little bladder of water of Bonomo. There is no difficulty in extracting the little animal; the cuniculus is seen without difficulty; the end of the cuniculus is perceived to be a little raised, while a grayish speck is seen beneath it. As soon as this little eminence of epiderma is lifted, if the end of the needle or pin with which the operation is performed be examined, the minute, white, and shining globe will probably be observed attached to the instrument. If there be no such object, the point of the needle placed again beneath the raised capsule of epiderma will pretty certainly draw it forth. This facility of extracting the little creature is due to its great power of clinging to any object with which it comes in contact.

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[1] Anno 1794, vol. iv.

[2] Otho Fridericus Muller. Anno 1776.

When the acarus is seen running upon the surface of a plate of glass, it may be perceived that its anterior margin presents a dusky tint of colour, and the examination of this part of the creature with the microscope brings into view a head not unlike that of a tortoise, and a pair of large and strong legs on each side of the head. These organs are encased in a moderately thick layer of chytine, and have consequently the reddish-brown tint of the cases of certain insects, or of the bright part of a thin layer of tortoise shell. Proceeding with our examination, we perceive the general outline of the animal to be subrotund, the antero-posterior predominating very little over the transverse diameter; the anterior part of the creature being broad, and the posterior somewhat narrower and semicircular. The ventral surface of the acarus is flat, and occupied by the head and eight legs; the dorsal surface is arched and uneven, and covered by numerous spines; and projecting backwards from the posterior segment of the animal are twelve hair-like filaments, some long and others short.

753. With the view of determining the size of the acarus, I measured ten specimens, and found them vary between $\frac{1}{147}$ and $\frac{1}{77}$ of an inch in length, and between $\frac{1}{303}$ and $\frac{1}{94}$ in breadth. The following were the measurements of seven of this number:—

Length.	*Breadth.*	*Length.*	*Breadth.*
$\frac{1}{147}$	$\frac{1}{153}$	$\frac{1}{88}$	$\frac{1}{109}$
$\frac{1}{128}$	$\frac{1}{303}$	$\frac{1}{77}$	$\frac{1}{160}$
$\frac{1}{119}$	$\frac{1}{147}$	$\frac{1}{77}$	$\frac{1}{94}$
$\frac{1}{94}$	$\frac{1}{143}$		

754. Examined with a quarter or eighth of an inch object-glass, or with Powell's half-inch, the case of the body of the acarus is seen to be composed of narrow plates, variously disposed with regard to the axis of the animal, but chiefly transversely, and resembling a coat of plate armour. The connecting membrane of these plates permits of a certain degree of movement between them. The *dorsum* of the creature is convex, but uneven, and exhibits upon its borders a tendency to division into a thoracic and an abdominal segment, the former being somewhat larger than the latter. Anteriorly the dorsal case terminates in a sharp border, which is scolloped, and forms a jutting roof of protection to the head, and to each of the four anterior legs. Posteriorly, the case is somewhat deeply cleft, forming a groove, which corresponds on the ventral surface with the sexual and anal aperture.

The dorsal surface of the creature is covered with tubercles, spines, and hair-bearing tubercles, regularly, and very remarkably disposed. The *venter* of the acarus is flat, and the abdominal portion slightly convex. The posterior part of the latter is grooved upon the middle line, and furnished with an anal and sexual aperture, of considerable size.

The *head* is an oblong cylinder, more or less obtusely pointed in front, flattened beneath, enlarging slightly laterally towards the body of the creature, and implanted by its posterior end into the angular interval left by the separation of the anterior pair of legs. The lateral enlargement towards the root of the head is the most suitable place for eyes; but I have not as yet been able to detect those organs. The head is surmounted by two rows of stiff hairs. The mouth is an oblong aperture situated upon the under surface of the head, and becoming broad towards the root of the latter. Its borders are furnished with a thick fringe of mandibles, and the interior supplied at each side with a number of strong maxillæ. The head is capable of elongation or retraction beneath the dorsal plate or carapax.

The *legs* are eight in number, four being anterior, and four posterior; the anterior legs are large and powerful, the posterior small. The anterior pair of legs are so large, so closely placed to the head, and directed so immediately forwards, as to deserve the appellation of arms. The next pair follow immediately on the preceding, but are directed outwards. The legs are conical in form, tapering, when extended, to an obtuse point, and composed of a hip-piece and three circular segments. The hip-pieces of the two anterior legs join at an obtuse angle, and form the limit of the root of the head. The point of meeting of these hip-pieces is the commencement of a sternal crest, which runs backwards on the plastrum for a short distance, and terminates by a rounded extremity. A similar crest is formed on each side by the junction of the hip-pieces of the anterior and lateral legs, the crest being directed backwards and inwards towards the termination of the sternal crest. Each of the annular segments of the anterior legs is furnished with three or four bristly hairs, which stand out at right angles from the segment. Moreover, the extremity of each anterior leg is provided with a tubular cylinder [tarsus] as long as the entire leg, and terminated at its extremity by a foot divided on its sole into five lobes.

The head and four anterior legs are covered by a strong case of chytine, which presents the ordinary colour of insect cases—namely, a brownish red. The plastrum is slightly tinted with a similar hue, but the three crests formed by the hip-pieces are, in virtue of their thickness, of a deep colour. These are the red lines of Gras, Raspail, and others. The posterior legs have but a thin case of chytine, and are less deeply coloured. The coloured covering of the head and legs contrasts very strongly with the yellowish-white of the body of the animal.

The posterior legs spring from the posterior part of the thoracic segment of the animal, two on each side; they are conical in form, composed of three segments, and each leg is connected to the body by means of a triangular and flattened hip-piece. Each posterior leg is terminated by a rudimentary tarsus and foot, and by a long membranous hair-like organ, which is directed backwards.

I have already alluded to the cleft on the posterior part of the abdominal segment of the animal, and the papilla which bounds the anal opening posteriorly. A pair of hair-like filaments surmounted on short tubercles are found on each side of this opening, near the posterior margin of the abdomen. These four filaments, with the four hair-like organs of the posterior legs, and the four directed backwards from the lateral part of the thoracic segment, form the twelve hair-like filaments which are observed along the posterior margin of the animal. These filaments, together with the hairs, spines, and tubercles situated on the dorsum, serve most effectually to prevent the retrogression of the acarus along its cuniculus, while the anterior part of the creature is equally well organized for advance.

I have not been able to distinguish any sexual differences between the animals I have examined. In a sketch before me is drawn a conical projection in this region, but I have not as yet seen that appearance repeated.

The ova I have seen, and I have preserved a slide, on which there are two of these bodies.

The internal organization of the animalcule is obscured by the large collection of adipose cells which form its superficial stratum.

HISTORY AND DESCRIPTION OF THE STEATOZOON FOLLICULORUM.

755. In the course of some researches directed to the investigation of the cause of acne, Dr. Gustav Simon of Berlin discovered an animalcule in the sebaceous substance with which the hair-follicles are so commonly filled, particularly on the face, and gave it the designation, *acarus folliculorum.*[1] Dr. Simon's researches have hitherto been directed principally to the sebiparous glands of the nose, where he finds the parasite with astonishing frequency, even in cases where the skin presents all the characters of perfect health. Of living persons he detected the animal in three out of ten men in the sebaceous matter squeezed out by pressure from the follicles; but in the dead he discovered them in almost every individual examined, the only exceptions out of ten bodies being two newly-born children. The mode of examination in the case of the dead was by means of thin sections. The animalcules imbedded in the sebaceous matter are found in the hair-follicles near to the outlet, their long axis corresponding with that of the follicle, and their heads being directed inwards; in four instances, the head and part of the body of the little creature were lodged in a sebiferous duct. In normal hair-follicles there are usually not more than one or two of these parasites; in rare instances, three or four; but where the sebaceous substance is concreted, their number varies from two to six; in one case, he found as many as eleven, and in another, thirteen. They are tardy in their movements, but retain their vitality for a considerable length of time; thus Dr. Simon has found them moving after a confinement of eight and twelve hours between two plates of glass, and in one body they were found alive after the person had been dead for six days.

---

[1] Müller's Archiv. 1842, p. 218. Ueber eine in den kranken und normalen Haarsäcken des Menschen lebende Milbe.

The animalcule presents several forms, which correspond with stages of development. In the most common form, the animal varies from 0,085 to 0,125 of a line (German) in length, and 0,020 of a line (German) in breadth; it has an elongated figure, a long thoracic portion, with four pairs of legs, and an abdomen three times as long as the thorax, and tapering gradually to an obtusely pointed extremity. The head consists of two large palpi, and of a proboscis situated between the two. The *palpi* are bi-jointed, and terminated by several small teeth-like processes. The *proboscis*, which is capable of elongation and retraction, resembles a long tube, upon which lies a triangular organ, having its narrow base directed towards the root of the former, and extending by its apex almost to the extremity of the proboscis. This triangular body consists of two bristles lying side by side. The *head* is continuous directly with the thorax, without any precise line of demarkation. The *legs* are short, conical, and composed of three segments, and upon the latter is an appearance of plaits. The leg is terminated by three claws, one long, and the other two short. From the anterior part of the basis of each leg a double line runs transversely inwards across the under surface of the thorax, towards the

Fig. 1.[1]

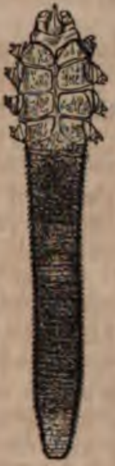


Fig. 2.

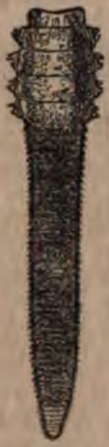
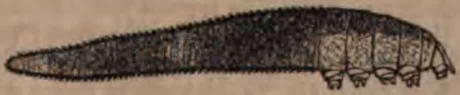


Fig. 3.



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[1] Fig. 1. The steatozoon seen upon its ventral surface. The structure of the head, feet, and plastrum are shown, as well as the annulate character of the abdomen. The figure is drawn to a scale of a line to the $\frac{1}{1250}$ of an inch.

Fig. 2. The steatozoon viewed upon its dorsal aspect. The head is retracted within the thorax.

Fig. 3. The steatozoon viewed upon its lateral aspect. The serration of the abdominal segments is somewhat exaggerated in all the figures.

middle, where one of the lines passes forwards and the other backwards, and they serve together to form a central longitudinal double line. The transverse lines are probably continued completely around the thorax. The thorax is highest at about the middle, and broadest at the point corresponding with the second pair of legs. The *abdomen* is marked by a number of transverse lines produced by a series of grooves or contractions, which give to the margin of this part a resemblance to a file. The contents of the abdomen are granular, and similar to those of pigment cells, and among these granules are several large transparent places of a round, oval, and sometimes quadrate form, like globules of oil. The tail is free from granules.

A second form was remarkable from having the abdomen once only, or one and a half times longer than the thorax. The abdomen is more or less obtusely pointed posteriorly, and marked by the characteristic transverse lines.

In a third form, the abdomen is very short and acutely pointed. The thorax is broad, and there are no transverse lines on the abdomen.

In a fourth form, the whole animal is remarkable for its slender figure; the abdomen is very long; there are only three pairs of legs, no transverse lines on the abdomen, and its granular contents are much more lightly tinted.

756. To what part of the animal kingdom does the parasite belong? asks Dr. Simon, and this question he refers to an eminent entomologist of Berlin, who returns him the following answer:—

The animal is clearly not an Helminthus, but its entire organization, and especially the great distinctness of its different pairs of legs, betoken it to belong to the great division, Insecta, of Linnæus. Of this extensive group, the parasite before us appertains to the class Arachnida, for there is no separation between the head and the thorax, there are no antennæ, and it has four pairs of legs; and judging from the form of its mouth, it should belong to the order Acarus. The proboscis is the under lip lengthened out, a form which this organ assumes in all mites. The two bristles lying on the proboscis are the mandibles, and the pair of two-jointed organs lying by the side of the proboscis are the maxillary palpi. The different forms in which the creature has been seen are stages of development. In the early state of the mite, the presence of three pairs of legs is a common character. The lengthened form here principally described is the second stage of development, and those with shorter abdominal segments represent later periods. It is therefore probable, that in the fully developed stage the abdomen is lost altogether, and we are inclined to believe that this last stage is not as yet known to observers. The distinctions of genus and sex are, consequently, not yet practicable.

In general, such a metamorphosis as the one here described does not occur in the mite, for these creatures retain the form, even although an additional pair of legs have to be developed, which they possessed on first breaking from the egg. But, on the other hand, Hartig has observed and described in the mite of the pine-gall (*Oribata geniculata*, Latreille,) a metamorphosis precisely analogous to that of the animalcule before us.

These animalcules cannot be metamorphosed into parasitic mites, for the itch-mite and mange-mite have distinctly segmented legs with joint-lobes (Heftläppchen,) and no metamorphosis, since they issue from the egg already provided with four pairs of legs. Earlier, some relationship might have been inferred between this animalcule and the bird-mite (Dermanyssus,) which, in its young state, has only six legs; but the worm-like form of our animalcule in its early stages, and the remarkable shortness of its legs, render comparison between them impossible.

The animal found by Donné in the mucus of the vagina (Trichomonas vaginalis,) which this observer considers to belong to the Infusoria, and, according to others, is more nearly related to Acarus, differs in many points, according to Donné's description and figure, from the acarus of the hair-follicles. For instance, it is often not more than double the size of a blood corpuscule, and at most $\frac{1}{100}$ of a line long; it has a round or elliptic-shaped body, with a whip-like appendage in front, and along one of its sides several fine fibres.[1]

Again, as the animalcule of the hair-follicles has not yet, as we conjecture, been seen in its perfect shape, it is possible, although little probable, that this last stage of development may correspond with some already known mite. In no case, however, could the animalcule, for the before-mentioned reasons, become one of the ordinary parasites of the human skin; but this creature must present the remarkable peculiarity of living within the human body in its young state, and in its perfect state, of living external to it. Further researches may serve to establish this question; in the mean time, however, I will designate this animal, from its habitat in the hair-follicles, *acarus folliculorum.*

757. About six times have I seen, both in the comedones of living persons and in the hair-follicles of the dead, a heart-shaped body, having a small process projecting from its broader end. This body was somewhat longer than the breadth of the animal, of a brownish colour, and appeared to be filled with a granular substance. In the hair-follicles, it was always close to the animalcule, but not connected with the latter. This observation, with the fact of the non-resemblance of the heart-shaped body with any known human structure, gives strength to the conjecture that it must bear some relation to the acarus. It might, for example, be an egg-shell, out of which an embryo has escaped.

In reference to the movements of the creature, I have been able to make the following observations:—The palpi are capable of being moved in different directions, of being drawn in, and stretched out. The latter movements are remarked also in the proboscis, which is sometimes thrust beyond the palpi, and sometimes drawn back. The legs can also be moved in various directions, and the creature is often seen to move them backwards and forwards like to a pendulum; they can also be retracted or stretched forth. The thorax and body admit of being curved. Although the creature makes all these movements, it does not walk, but merely changes its position from side to side; once, indeed, I saw an acarus walk a distance equal to his own length, but then it was along a hair, which he closely grasped.

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[1] The trichomonas vaginalis, with which I am well acquainted, bears no resemblance whatever to the steatozoon folliculorum. The trichomonas is a globular sac, slightly drawn out to a point at some one point of its periphery; and having connected with this point a flexible and mobile pedicle, which acts the part of a sucker. The sac measures about $\frac{1}{2000}$ of an inch in diameter. I have not seen Donné's figure.—E. W.

Dr. Simon remarks, that he saw the first and second described forms most frequently, and the third and fourth forms—namely, that with the short and pointed abdomen, and the slender animal with three pairs of legs, only rarely; the former in the proportion of ten per cent., and the latter of six per cent. But he feels so convinced of the accuracy of his observation, that he regards as the most positive of his data, the presence of six legs only in some.

758. After perusing the account of the steatozoon folliculorum, as given by its discoverer, Dr. Simon, I determined to proceed to a verification of his discoveries, and being provided with an instrument probably superior to that employed by Dr. Simon, I have succeeded in making out certain points of structure that had escaped his observation.

I was not long in obtaining subjects: almost every face that I met supplied me with abundance, and the difficulty seems to be, not to find the creature, but to find any individual, with the exception, according to Dr. Simon, of newly-born children, in whom these animalcules do not exist. It is by no means necessary to commence our search by selecting an acne punctata, or even a comedo; almost every collection of sebaceous substance which can be squeezed forth from the numberless cutaneous apertures upon the nose, the forehead, the face, and probably from other parts of the body, will furnish subjects. Moreover, Dr. Simon has observed that the parasites are situated near the mouth of the follicle, consequently that portion of sebaceous substance which is squeezed out with the least force is the part which is most likely to be inhabited by the acarus.

The steatozoon folliculorum would seem to give rise to no uncomfortable effects by its presence, unless, perchance, it should multiply to such an extent as to become a source of irritation to the follicle—a supposition which Dr. Simon admits, for it is found in persons whose skin is perfectly healthy and clear, and in whom no signs of cutaneous irritation are present. These animalcules undoubtedly feed on the sebaccous substance in which they lie imbedded, and which is the cause of their existence. I have commonly found two in the small mass of this substance expressed by the fingers, often four and five, and, in one instance, eight, closely connected together. Hitherto, I have confined my examinations to living persons, having levied for contributions among my more intimate friends, and have not as yet had recourse to a skin studded with acne.

In the course of my investigations, I have examined several hundreds of these animalcules, and have seen all the forms described by Dr. Simon; I have also had the good fortune to discover the embryo and the ovum. I cannot, however, agree with Dr. Simon with regard to the phases of development, which he imagines to indicate perfection of growth; on the contrary, I am inclined to believe the most common to be the most mature form, and the third or most perfect of Dr. Simon, an embryonic form. The following are the extremes of measurement of the perfect animal in fractions of an English inch, according to my examinations:—

Entire length.	*Length of abdomen.*	*Breadth of thorax.*
$\frac{1}{135}$	$\frac{1}{227}$	$\frac{1}{555}$
$\frac{1}{64}$	$\frac{1}{88}$	$\frac{1}{555}$

The animal is divisible into a head, a thorax, and abdomen, the whole of these parts being well and distinctly marked.

The *head* represents in form a truncated cone, flattened from above downwards, and directed obliquely downwards from the anterior part of the trunk. It is composed of two large lateral organs, termed by Simon maxillary palpi, and of an intermediate triangular organ. The *maxillary palpi* constitute the most considerable proportion of the head. Each is composed of three segments, and is furnished with a prehensile extremity, consisting of three curved finger-like organs, or claws. The first segment of the maxillary palpus is large and long, the two succeeding segments are smaller, and in every respect resemble the segments of which the legs are composed. Indeed, these maxillary palpi perform the office of arms, the first segment being fixed, and the next two bending downwards under the first, or being stretched directly forwards. It is this flexion and extension of a jointed organ that Dr. Simon mistook for extension and retraction. Upon the under part of the first segment of the maxillary palpi I have observed a circle, which appears to me to bear some resemblance to an eye; upon this point, however, I am not quite satisfied.

The *triangular organ*, which includes the mouth of the creature, is composed of three elementary parts—namely: 1. Of a triangular process, a prolongation of the membranous case of the animal from the neck along the middle line of the upper surface of the head, to the extremity of the latter, where it curves downwards, and in the latter situation consists of two parallel pieces placed side by side. 2. Of a funnel-shaped and tubular organ, or sucker, occupying a central position with regard to all the other cephalic organs. 3. Of another triangular narrow process, situated upon the under part of the head, and composed of two lateral pieces.

The head is connected to the anterior segment of the thorax by a loose membrane, marked on its surface by transverse lines, which indicate its susceptibility of being thrown into folds. This membrane is intended to admit of the retraction and extension of the head, and by its means the entire head may be drawn in and buried deeply beneath the level of the membranous fold here described, so that the head is entirely lost to view, and the animal looks decapitated, the fold of the cervical membrane forming a perfectly straight border in front. This is a peculiarity in the structure of the animal that has been passed over by Dr. Simon; he makes no allusion to any such power, and he undoubtedly would have done so had he observed it, for the effect of the retraction is too remarkable not to be instantly recognised. In fact, when an animalcule is alternately retracting and extending its head, the impression on the eye of the observer is that of a creature one while furnished with a well-defined head, and the next instant decapitated back almost to the level of the anterior segment of the thorax. The appearance presented by the animal during the retraction of its head is represented in the wood engraving, fig. 2.

The movements of the maxillary palpi are flexion of the last two segments, the first segment appearing to be firmly connected with its fellow of the opposite side, and being very limited in its movement of flexion. The extension of these segments upon the first has led Dr. Simon to infer that the palpus might be pushed out, and the sudden disappearance of these two segments, by flexion underneath the first, has induced him further to believe that they might also be retracted. It might be imagined, that when the creature is seen from its under surface, this error would become immediately apparent; but that is not the case; for the fore-shortening exhibited in the latter view only tends to increase the deception. The three finger-like claws at the extremity of the palpus are also capable of motion, and grasp upon any object within their reach. The triangular pieces, both of the upper and lower part of the head, move upwards and downwards on each other, and at the same time separate to a slight extent.

The *thorax*, which is the broadest and thickest part of the animal, and somewhat tun-shaped, is flattened on its under surface. It is composed of four broad segments, which are free and joined by a connecting membrane on the dorsum and sides of the creature, but are continuous inferiorly with the broad and strong plastrum which covers the whole inferior surface of the thorax. The segments are somewhat convex in their antero-posterior diameter, particularly at the upper part, so that the outline of the chest in this situation has the appearance of being slightly fluted. The anchylosis of the four segments composing the plastrum is marked by four transverse markings, consisting each of two ridges, which correspond peripherally with the interspaces between the legs, and centrally bifurcate, one passing forwards to unite with the line in front, the other passing back, to become continuous with that behind. The same arrangement takes place on the opposite side, and a sternal line, consisting of a double crest, is consequently formed. The ridges of the plastrum here described, being thicker than the rest of the covering of the animal, are strongly and characteristically marked.

The segmented structure of the thorax permits of a certain degree of movement in this part of the creature.

The *legs*, which are eight in number, are connected with the sides of the plastrum, each segment of the thorax sustaining one pair of these organs. They are conical in figure, the base of the cone being broad, and its apex obtusely truncated, and furnished with three finger-like claws. Each leg is composed of three segments, of a proximal segment, which is large, and almost triangular in form, the base of the triangle (scalene) being directed forwards, and two smaller, cylindrical segments, the distal segment supporting the three finger-like organs above noted. The legs are all of the same size.

The movements of the legs are a forward and a backward movement, the two small segments forming an acute angle in their bend forwards upon the proximal piece, and being extended directly backwards when the extension is completed; so that, when the creature advances its leg, and places it on a flat surface, the two small segments are directed forwards, and by their underside, rest upon the ground, together with the foot, like the long hind-foot of the rabbit; then clutching upon some object within reach, the segments are carried backwards until they form a straight line with the axis of the proximal piece. By this movement an enormous power of propulsion is gained by the creature, and it moves forward with considerable force. Dr. Simon remarks, that the animal performs a swimming movement with its legs, but without making any advance. That observation may, I think, be explained, by its compression, however slight, between two plates of glass; by the injury the animal has received in being pressed from the hair-follicle along with the sebaceous substance; and by the fact of the glass upon which it attempts to walk affording no rough points to which it can attach itself. The legs are very irregular in their movements.

The *abdomen* is somewhat variable in point of length, but generally more than two or three times longer than the thorax. It is flattened on its under surface, and convex above, and tapers gradually from its base to its extremity, where it terminates in a rounded point. It is composed of a series of extremely narrow annular segments, which overlap each other from before backwards. When examined on either surface, the margins of these segments present the appearance of a regular succession of transverse lines, and when seen along the outline, they give to it the character of a serrated edge. The extremity of the abdomen is sometimes lengthened out into a small pointed process. The aperture of the anus is seen upon the under surface of the abdomen, near its extremity.

The annulated structure of the abdomen which is here described, permits it to move with considerable freedom, and to curve in any direction.

Of the *internal structure*, Dr. Simon says nothing more than that the abdomen is filled with granular contents, and exhibits several large and irregular vesicles, which he compares to oil-globules. The granular matter of Simon is cellular tissue in its most simple form; with a good object glass, the cells are quite distinct, and appear to be filled with adipose fluid. These cells are variable in point of size, some being exceedingly minute, and others of moderate bulk; they are assembled in such considerable number in the abdomen, as to give it a dark appearance, and by forming a thin stratum upon the inner surface of the integument, they obscure the alimentary canal. Sometimes the cells are confined to the abdomen, but more frequently they extend into the thorax, forming a narrow line, that may be traced almost as far as the head. By careful examination, I have succeeded in distinguishing the muscular fasciculi, which move the legs, and a broad œsophagus. In the abdomen I have traced also the outline of an alimentary canal, and have seen it terminate by an infundibuliform extremity at the anus. The transparent cell-like organs seen in the abdomen of the perfect animal, I regard as dilatations, or convolutions of the alimentary canal; and a dark, brownish mass in the commencement of the abdomen I consider to be the liver. I have been unable to discover any sexual differences in the numerous examples which I have examined.

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